

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXIX: No. 10.

New York, Thursday, March 9, 1882.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

Steam Hammer at the Parkhead Forge, Scotland.

The works known as the Parkhead Iron and Steel Forge and Rolling Mill, Scotland, have long been famous for the excellence and extent of the forgings which they have turned out from time to time. Until within a few months the works had 16 steam hammers in operation, the oldest of them being the "Cyclops," a 7-ton Nasmyth hammer, which was erected at Parkhead about thirty-five years ago. As the works gradually extended other steam hammers were put in, and in the year 1854 the "Cyclops" was eclipsed by the "Hercules," also a Nasmyth hammer, rated at eight tons. Some twenty years ago one of the partners of the works devised a totally different type of steam hammer, one in which the hammer-head, piston-rod and piston were all in one piece. This new type of hammer had a number of advantages, and was consequently not long in finding its way into extensive use. Having resolved about two years ago to engage in the manufacture of mild steel by the Siemens process, for ship and boiler plates, &c., and seeing that the new branch of their business increased far more rapidly than they had anticipated, the proprietors found it to be necessary to provide a new hammer capable of working heavy ingots preparatory to their being rolled into large plates. The result was the hammer which we illustrate this week, and which was named the "Samson." It is spoken of as a 12-ton hammer, and is stated to be one of the most powerful tools of the kind in Scotland. The foundation on which the hammer rests is a bed of iron concrete, shown by Figs. 4 and 5, this bed consisting of Portland cement, slag, iron borings, &c., in the following proportions:

| | Tons. |
|----------------------|-------|
| Slag..... | 106 |
| Bush dirt..... | 44 |
| Iron borings..... | 32 |
| Portland cement..... | 62 |

Total..... 353

It should be mentioned that the slag used in the composition of the concrete was that obtained from the puddling furnaces and steel-melting furnaces of the works. This bed of concrete, which eventually hardened into a solid mass of great strength and tenacity, was deposited on a bed of blue "till" lying at a depth of 23 feet from the surface of the ground—the length of the concrete block being 22 feet 8 inches, and the breadth 17 feet 4 inches. As represented in Fig. 4, there is laid on this mass of concrete a packing of wood, consisting of two layers of red pine in beams of 12 inches square. Between these two layers of timber, however, there is a thin layer of iron borings, which, by the action of the water passing through the foundation structure, form a compound possessing the reputation

which is part of the casting, and which measures 10 by 8 feet, with a thickness of 15 inches. Its entire weight when cast was about 43 tons. This anvil block was the heaviest casting ever made in Scotland, and removed from the place where it was cast. The top of the block is recessed for the introduction of a steel plate 3 inches thick and 3 feet long by 2 feet 8 inches broad. This plate can be removed when desired. The anvil was made of cast steel of a very hard

16½ inches. (See Fig. 6.) The extreme length of stroke is 6 feet. The top, or hammer-head, also made of Siemens steel and cast at Parkhead, is about 4 feet high. (See Fig. 1.) Its diameter at the top is 2 feet 8 inches, the face measuring 3 feet 3 inches in length by 15 inches in breadth, and its weight being 4 tons, so that the entire weight of the moving mass is 12 tons. The hammer-head is drifted on to the end of the piston-rod.

wedges being inserted in such a way as to fit the "flats" of the rod, and thereby preventing all tendency toward turning on the part of the latter. Immediately under the girder, and clamped to it, is placed a wooden buffer, so as to provide against all possibility of mishap through the piston being allowed to lift too high, and thereby injuring or driving off the cylinder cover.

The main girder first mentioned is supported by two massive cast-iron columns, 13

feet high and 3 feet in diameter, the metal in the body being 3 inches thick. These columns weigh about 10 tons each, and the beam forming the cross-girder is fitted on their tops by means of spigot and faucet joints being firmly bolted into each of them by means of twelve 1½-inch steel bolts, as seen in Fig. 6. The columns rest on a layer of beechwood 1 inch thick, placed on cast-iron sole-plates 12 feet 6 inches long, 8 feet broad and 6 inches thick, and having two strong feathers and webs on the under face. Heavy snags are cast on the upper surface of the sole-plates, between which and the bases of

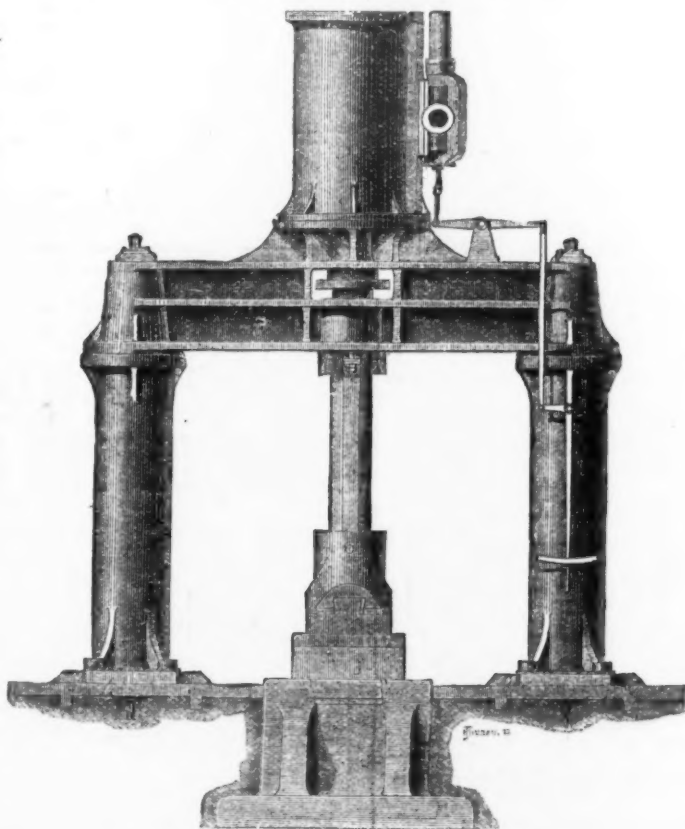


Fig. 1.



Fig. 2.

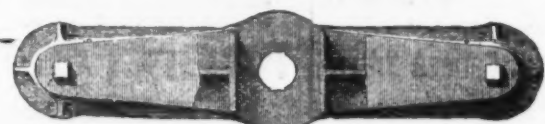


Fig. 3.

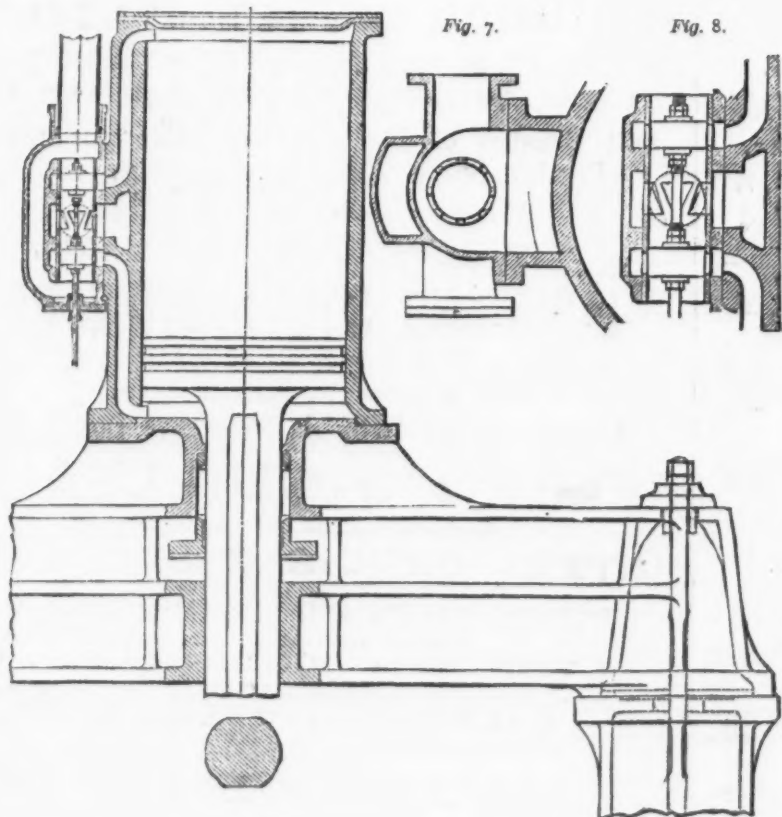


Fig. 6.

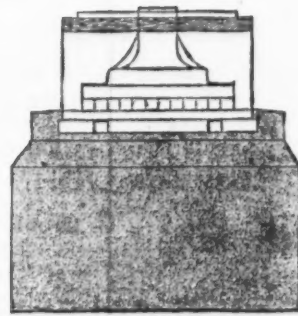


Fig. 4.

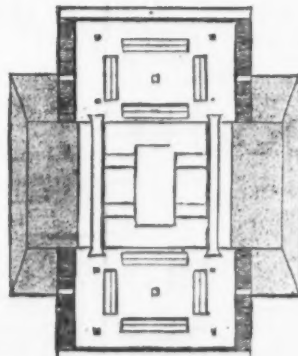


Fig. 5.

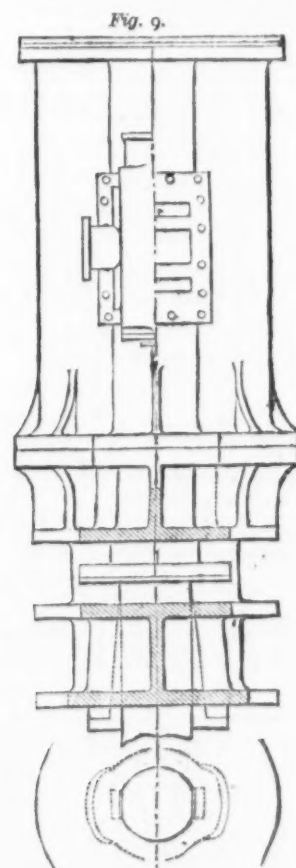


Fig. 10.

STEAM HAMMER AT THE PARKHEAD FORGE, SCOTLAND.

of being a good preservative of wood. Layers of fine iron borings are likewise distributed over the top of the concrete and immediately over the top course of timber—in the latter case the thickness being about 4 inches. A foundation such as that just described is stated to possess a high degree of elasticity, while the use of the iron concrete makes a very large and expensive anvil block unnecessary. In this particular case the anvil block, shown in several of our illustrations, is a comparatively small mass of iron, being 6 feet 6 inches long, 3 feet broad and 6 feet deep, including a flange,

quality, and was supplied by Messrs. Henry Bessemer & Co., of Sheffield.

The piston and piston-rod are in one piece, weighing about eight tons. The mass of steel from which this moving part was made was cast at Parkhead in one ingot, which was drawn down under one of the heavy forge hammers, and subsequently turned and planed to a diameter of 48 inches and a thickness of 12 inches for the piston proper. That portion which was to become the piston-rod was reduced in the same way to 18 inches in diameter, the sides being flattened off so as to give a total thickness of

The hammer, as shown in Fig. 1, is mounted on a cross-girder, this being a casting of about 19½ tons weight, being 21 feet long by 3 feet 6 inches deep at each end, and increasing to 5 feet 1½ inches at the center, where the steam cylinder rests upon it. The bottom flange of the girder is 3½ inches thick and 3 feet 6 inches broad, this breadth swelling out at the center to 4 feet 9 inches, the top flange being somewhat narrower. An opening through the center of the beam or girder serves for the introduction of the necessary packing gland. The lower part of the girder acts as a guide for the piston-rod,

feet high and 3 feet in diameter, the metal in the body being 3 inches thick. These columns weigh about 10 tons each, and the beam forming the cross-girder is fitted on their tops by means of spigot and faucet joints being firmly bolted into each of them by means of twelve 1½-inch steel bolts, as seen in Fig. 6. The columns rest on a layer of beechwood 1 inch thick, placed on cast-iron sole-plates 12 feet 6 inches long, 8 feet broad and 6 inches thick, and having two strong feathers and webs on the under face. Heavy snags are cast on the upper surface of the sole-plates, between which and the bases of

there is ample room around the anvil to manipulate the most cumbersome masses with great ease and readiness. Ingots weighing 42 cwt. have been subjected to "Samson's" treatment without inconvenience, and it is even contemplated to work ingots up to 4 tons in weight with the aid of the ordinary hand levers. The construction and erection of the hammer were entrusted to Messrs. Miller & Co., of Coatbridge, who deserve credit for the excellence of the work.

M. Menudier has recently laid before La Société d'Encouragement, Paris, a scheme

Metals.

**ANSONIA
BRASS & COPPER CO.,**
No. 19 CHURCH ST.,
Phelps Building, NEW YORK.

BRASS AND COPPER
IN
Sheets, Bolts, Rods, Wire, &c.
**Seamless Brass & Copper
Tubing.**

Ansonia Corrugated Stove Platforms.
PURE COPPER WIRE
For Electrical Purposes, Bare and Covered.
Phosphor Bronze Rods for Pumps, &c.

**ANSONIA ★ REFINED
INCOT COPPER.**

PHELPS, DODGE & CO.

IMPORTERS OF

**TIN PLATE,
ROOFING PLATE,**

Sheet Iron, Copper, Pig Tin Wire,
Zinc, &c.

MANUFACTURERS OF

COPPER AND BRASS.

CLIFF STREET, NEW YORK.

SCOVILL MFG CO

**BRASS,
HINGES, WIRE, GERMAN SILVER.**

PHOTOGRAPHIC GOODS.

**BUTTONS,
CLOTH AND METAL.**

DEPOTS: 419 & 421 Broome St., N. Y.
177 Devonshire St., Boston.
183 Lake St., Chicago.

FACTORIES:
Waterbury, Conn.
New Haven, Conn.
New York City.

DICKERSON, VAN DUSEN & CO.,

Importers of

Tin Plate, Pig Tin, Sheet Iron, Copper,
Wire, Zinc, Etc.

39 & 51 CHURCH ST., cor. Fulton,
DICKERSON & CO., Liverpool. NEW YORK.

A. C. NORTHROP,

Waterbury, Conn.,

**NOVELTIES IN BRASS AND OTHER METAL GOODS
FOR HARDWARE TRADE.**

Wrought Iron and Brass Machine Screws; Turned, Hexagon, Round and Square Head Cap and
Set Screws; Brass and Iron Safety and Jack Chain; Gilt, Nickel Plated and Bronze Trimmings of all
kinds, from Sheet Iron, Steel or Brass.
Estimates on patented articles, or any description of Sheet Metal work, respectfully solicited and
promptly given.

WORKS

ROEBLING'S

AT
TRENTON,

N. J.

WIRE ROPE

New York Office

AND
Warehouse,

117 Liberty Street.

THE JOHN A. ROEBLING'S SONS CO.,

MANUFACTURERS OF

WIRE ROPE

OF
Iron, Steel and Copper,
FOR

Hoisting Purposes of all
kinds, for Ferries, Stays,
Ship Rigging, Sash Cords,
Lightning Rods, &c., &c.
Suspension Bridge Cables.

GALVANIZED

Telegraph Wire,
Market Wire,
Vineyard Wire.

Iron and Steel

WIRE

FOR
Market Wire, Fence Wire,
Bridge Wire, Chain Wire,
Buckle Wire, Spring Wire,
Rivet Wire, &c., &c.

GALVANIZED WIRE CLOTHES LINES.

BRODERICK & BASCOM,

MANUFACTURERS OF

**Iron
Wire Rope.**



**Steel
Wire Rope.**

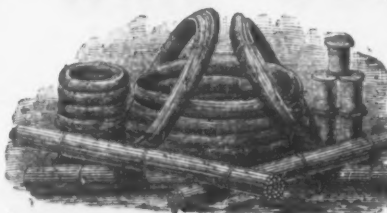
728 N. Main St., St. Louis, Mo.

WORCESTER WIRE CO.,

Manufacturers of

**IRON AND STEEL
WIRE**

For all Purposes.
WORCESTER, MASS.

**Metals.**

Waterbury Brass Co.

CAPITAL, - - \$400,000.

Sheet, Roll and Platers' Brass,
GERMAN SILVER,
Copper, Brass and German Silver Wire,
BRASS AND COPPER TUBING,
COPPER RIVETS & BURS,
BRASS KETTLES,
Door Rail, Brass Tags,
PERCUSSION CAPS,
POWDER FLASKS,

Metallic Eyelets, Shot Pouches, Tape Measures, &c.
And small Brass Wares of every Description.
Cartridge Metal in Sheets or Stells a Specialty.
Sole Agents for the

Capewell Mfg. Co.'s Line of Sport-
ing Goods.

DEPOTS:

296 Broadway, New York,
125 Eddy St., Providence, R. I.

Mills At

WATERBURY,
Conn.

**Detroit Copper & Brass
Rolling Mills.**

**BRAZERS' AND SHEATHING COPPER,
ROLLED, SHEET & PLATERS' BRASS**

GERMAN OR NICKEL SILVER,
Copper Wire for Electrical and other purposes,
Brass and German Silver Wire,
Copper Rivets and Burs,

COPPER BOTTOMS FOR TEA KETTLES AND BOILERS,
Cor. Larned & Fourth Sts., Detroit, Mich.

NEW YORK AGENCY:
UNION HARDWARE CO.,
87 Chambers and 68 Rende Sts.

ROME IRON WORKS,

Manufacturers of

**Brass, Gilding Metal, Cop-
per and German Silver**

(In Sheets, Rods, Tubing or Wire),
**COPPER & BRASS RIVETS
AND BURS.**

Rome, New York.

Metals.

**The Plume & Atwood
Mfg. Company,**

MANUFACTURERS OF

SHEET and ROLL BRASS and WIRE,

German Silver and Gilding Metal,

Copper Rivets and Burs,

Copper Electrical Wire, Pins,

Brass Butt Hinges,

Jack Chain,

Kerosene Burners,

Lamp Trimmings, &c.

18 Murray Street, New York.

13 Federal Street, Boston.

109 Lake Street, Chicago.

Rolling Mill, Factories,
THOMASTON, CT. WATERBURY, CT.

Bridgeport Brass Co.,

MANUFACTURERS OF

Sheet and Roll Brass,
Brass & Copper Wire & Tubing,
German Silver Metal and Wire,
Copper and Iron Rivets.

OILERS and CUSPADORES, LAMPS and TRIMMINGS,
KEROSENE BURNERS,
PLUMBERS' MATERIALS.
Particular attention paid to cutting out Blanks and
manufacturing Metal Goods.

MANUFACTORY, WAREHOUSE,
Bridgeport, Conn. 19 Murray St., N. Y.

THOS. W. FITCH, Pres. and Treas. A. A. LASAR Secy.



Holmes, Booth & Haydens,

WATERBURY, CONN.

NEW YORK, BOSTON,
49 Chambers St. 18 Federal St.

Manufacturers of all kinds of

Brass, Copper & German Silver,

ROLLED AND IN-SHEETS.

BRASS & COPPER WIRE,

Tubing, Copper Rivets & Burs.

BRASS & IRON

JACK CHAIN, DOOR RAIL.

German Silver Spoons,

SILVER PLATED FORKS & SPOONS,

Kerosene Burners, &c.

JOHN DAVOL & SONS,

Agents for

Brooklyn Brass & Copper Co.,

Dealers in

Ingot Copper, Spelter, Lead, Tin,

Antimony, Solder & Old Metals.

100 John Street, New York.

PASSAIC ZINC CO.

Manufacturers of

Pure Spelter

FOR

Cartridge Brass, Gas Fixtures, Bronzes
AND ALL FINE WORK.

Also for

Galvanizers & Brass Founders.

MANNING & SQUIER, Gen'l Agents,

113 Liberty Street, N. Y.

Geo. W. Prentiss & Co.,

HOLYOKE, MASS.,

MANUFACTURERS OF

IRON WIRE.



Bright, Coppered, Annealed and Tin
Plated. Also GUN SCREW WIRE
of all sizes straightened and cut to order.

The Schoenberg Metal Mfg. Co.,

Manufacturers of and Dealers in

SOLDER, TYPE,

Stereotype, Electrotype and Babbitt Metals,
Importers of Block Tin, Antimony, &c. Refiners of
Lead, Spelter, &c. Highest price paid for Old Metals
and all kinds of Brass. 324 and 326 East 30th
Street, between Avenues A & B, New York.

Wire, etc.

PHILIP L. MOEN,
President & Treasurer.

CHARLES F. WASHBURN,
Vice President & Secretary.

Washburn & Moen Mfg. Co.

Established, 1831.

Capital, \$1,500,000

WORCESTER, MASS.

WIRE DRAWERS.

Patent Galvanizing, Rolling and Tempering.

MANUFACTURERS OF

IRON, AND IRON AND STEEL WIRE.

Of Every Description.

A SPECIALTY MADE OF

GALVANIZED TELEGRAPH WIRE,

GALVANIZED TELEPHONE WIRE,

PATENT STEEL WIRE BALE TIES,

PATENT STEEL BARB FENCING,

AND PUMP CHAIN.

NEW YORK OFFICE:

21 Cliff St.

ST. LOUIS WAREHOUSE:

802 No. Second St.

CHICAGO WAREHOUSE:

107 Lake St.

'NATIONAL WIRE AND LANTERN WORKS,'

Warehouse, 45 Fulton Street, New York.
And California Wire Works Co., San Francisco, Cal.

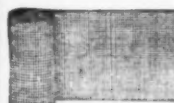
Manufactory, Nos. 1197, 1199, 1201, 1203, 1205, 1207, 1209 and 1211 De Kalb Avenue, Brooklyn, N. Y.

HOWARD & MORSE,

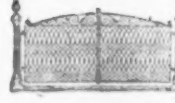
MANUFACTURERS OF

BRASS, COPPER & IRON WIRE CLOTH,

Exclusive Manufacturers of the



Wire Cloth, partly
unrolled.



No. 16 Pattern, Drive
Way Gates.

HEAVY ROLLED CLOTH FOR MALT KILN FLOORS.

Wire Work, Wire Fence, Railing and Guards.

ABRAM S. HEWITT, President.

WM. HEWITT, Vice President.

JAMES HALL, Treasurer.

E. HANSON, Secretary.

THE TRENTON IRON COMPANY,

(INCORPORATED 1847),

TRENTON, N. J., Manufacturers of

IRON and STEEL WIRE

OF ALL GRADES.

BRIGHT, ANNEALED, COPPERED, TINNED AND GALVANIZED

Iron and Steel Wire Rods;

EXTRA QUALITIES OF BAR IRON AND RODS.

Best Qualities of Gun-Screw and Charcoal Iron Wire;

Crucible, Siemens-Martin and Bessemer Steel Wire.

Wire Straightened and Cut to Lengths.

New York Office, COOPER, HEWITT & CO., 17 Burling Slip.

Philadelphia Office, JOHN HEWITT, Agent, 21 North Fourth St.

IRON AND STEEL WIRE ROPE

For Hoisting, Running & Standing Ropes, Ferries, &c.

CONSTANTLY KEPT ON HAND.

Address: **HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.**

FELTEN & GUILLEAUME,

Carlswerk, near Cologne, Germany.

PATENT CRUCIBLE STEEL WIRE,

For Mining and Flow Ropes, Hawser and Bridge Cables.

SIEMENS-MARTIN AND BESSEMER STEEL WIRE,

Flusselien, Swedish and German Charcoal Wire.

GALVANIZED TELEGRAPH WIRE

of Charcoal and Swedish Iron and Steel, also with high conductivity, and in long lengths.

GALVANIZED STEEL WIRE,

For Plain, Barb and Strand Fencing, 3, 4 and 7-ply Strand, Staples, &c. Annealed and Oiled Fencing
Wire, round and oval.

WIRE ROPE

OF EVERY DESCRIPTION.

TELEGRAPH CABLES.

Contractors to the German and Foreign governments. The oldest house in the branch on the Con-
tinent. Telegraph Address, **CARLSWERK, COLOGNE.**

General Agents for U. S. and Canada,

PERKINS & CHOATE, 23 Nassau St., N. Y.

A. LESCHEN & SON,

Manufacturers of

WIRE ROPE

OF EVERY DESCRIPTION.

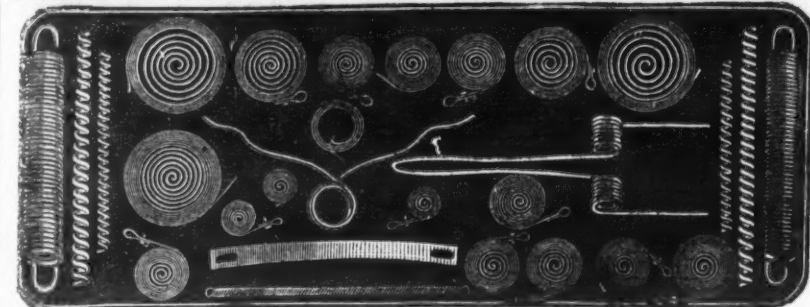
919 to 923 N. Main St., ST. LOUIS, MO.

Correspondence invited.

O. LINDEMANN & CO.,
Manufacturers of all kinds of
Japanned, Brass & Tin Plated
BIRD CAGES.
Catalogues furnished to the trade.
254 Pearl St., NEW YORK.



CARY & MOEN,
Manufacturers of
STEEL WIRE for all purposes and **STEEL SPRINGS** of every description.



Market Steel Wire, Crinoline Wire, tempered and covered.
Also Patent Tempered Steel Furniture Springs, constantly on hand.
934, 936 and 938 West 29th Street, NEW YORK

LIGHT HOISTING MACHINERY.
40 Page Illustrated Catalogue Just Issued. Sent Free on Application.
Salesrooms,
NEW YORK, 53 Chambers Street.
BOSTON, 224 Franklin Street.
YALE LOCK MFG. CO.,
MANUFACTURERS, ENGINEERS AND MACHINISTS.
Office and Works,
STAMFORD, CONN.
Salesrooms,
PHILADELPHIA, 507 Market Street.
CHICAGO, 64 Lake Street.

POPE, COLE & Co.
BALTIMORE COPPER WORKS,
No. 57 South Gay St., BALTIMORE, MD.,
Have always on hand and for sale
INGOT COPPER,
Also Cakes, of unequalled purity and toughness.

G. Gunther,
Manufacturer of
Patented Brass, Silver Plated
and Japanned
BIRD CAGES.
Can be nested for export shipments.
46 Park Place, NEW YORK.
Largest variety in patterns and unsurpassed in low prices. New Illustrated Catalogues and Price Lists on application.
FOUNDRIES' METALLIC Pattern Letters and Figures,
To put on patterns of castings. All sizes. Reduced prices. Mfg. by H. W. Knight, Seneca Falls, N.Y.



GAUTIER STEEL DEPARTMENT
OF THE
CAMBRIA IRON CO.
PHILIP E. CHAPIN, Gen'l Superintendent.

STEELS, WIRE & SPRINGS.

Fence Staples,
Black or Galvanized,
In 100 lb. kegs.
Staple Barbs,
Coppered or Galvanized,
In 100 lb. kegs or 25 lb. boxes.

NEW YORK Eastern Office & Warehouse, 51 John St.
WORKS: **JOHNSTOWN, PENN.**
PHILADELPHIA Office and Warehouse, 593 Arch Street.

Thompson's Patent for Wet Pulverization of Rocks, Ores, Rolling Mill Fix
AND OTHER MATERIAL,
EITHER COARSE OR TO AN IMPALPABLE POWDER.
STEPHEN P. M. TASKER,
SOLE MANUFACTURER,
Care of MORRIS, TASKER & CO., Limited,
PHILADELPHIA, U. S. A.



Centrifugal force applied to a rolling ball for the purpose of pulverizing. Tested thoroughly and guaranteed to yield a greater product of pulverized material of equal fineness in a given time with less wear, less power, less first cost and less cost for repairs than stamps or any other pulverizer.

IRON ROOF CRESTING, WEATHER VANES,
Tower Ornaments, &c.
Also,
Wrought Iron Fence,
For Residences, Court Houses, Cemetery Lots, &c.
IRON SHUTTERS, WINDOW GUARDS,
Balcony Railing, &c.
Parties wanting work in this line will be furnished illustrated catalogue and price list upon application.
Manufactured by
E. T. Barnum's Iron and Wire Works,
Detroit, - Mich.



Established 1838.
Bevin Bros. Mfg. Co.,
Easthampton, Ct.
Manufacturers of
SLEIGH BELLS,
House, Tea, Hand, Gong Bells, &c.
Bell Metal Kettles.



J. A. EMERICK. **HOWARD EVANS**
Molders' Tools,
FOUNDRY FACING,
MOLDING SAND,
FOUNDRY SUPPLIES,
J. A. EMERICK & CO
1056 to 1076 Beach St., PHILADELPHIA.



DETROIT STAMPING CO.,
DETROIT, MICH.
BRASS, BRONZE, COPPER, TIN,
And other Sheet Metal Goods to order.
ELECTRO-PLATING IN ALL ITS BRANCHES.

BROWN'S ADJUSTABLE PIPE TONGS.
Made from
best selected
Iron.
Address
The Ashcroft Mfg. Co.,
111 LIBERTY STREET, NEW YORK.



for maintaining constant communication between all trains traveling on the same line. For this purpose a telegraph wire is carried on supports, about 10 inches high, placed between the rails. The axle of the guard's van is provided with a circular wire brush, which revolves with it, and the wires forming this brush press continually upon the telegraph wire, making a perfect contact, whether the train is stationary or in motion. The brush is connected with one of the poles of a telegraph instrument in the van, and the other pole communicates with the earth through the wheels and rails. If a signal is sent from one train it passes through the brush into the wire and will be received by the instrument in every train on the same line. In case of an accident this arrangement would be of considerable value in stopping all trains coming in the same direction. The cost of laying the line is stated to be about \$24 per mile, no estimates being furnished concerning the cost of the apparatus in the guard's van.

The New French Tariff.

The Department of State has received from the Consul-General at Paris a revised edition

of the new tariff of France, accompanied by a comparative statement of the old, the conventional and the new tariffs, especially in respect of articles which were prohibited, or subjected to prohibitory duties, in the old tariffs. The only nations having treaties or conventions of commerce with France are England, Belgium, Italy, Switzerland, Sweden and Norway, Holland, Portugal, Austria, Turkey and Germany. As is known, repeated movements have been made toward a commercial treaty between the United States and France, but without success. In the schedule given the first column shows the duties formerly imposed upon merchandise imported from countries having no treaties of commerce or conventions with France, including the additional duty of 4 per cent. fixed by the law of December 4, 1873. The second column shows the duties to be levied on merchandise imported from countries in treaty relation until such treaties or conventions expire. The third column shows the duties under the new general tariff. The duties are in francs (19.3 cents) or centimes. The unit is the quintal, or 100 kg., equal 220.46 pounds. In this place only the schedules of metals or manufactures thereof are given.

| Articles. | Per 100 kg. | Per 100 kg. | Per 100 kg. |
|---|-----------------------------|-----------------------------|----------------|
| Cast iron—Rough, in masses weighing 15 kg. or more. | 4 90 | 2 00 | 2 00 |
| Refined, in masses weighing 15 kg. or more. | 5 75 | 2 75 | 2 00 |
| Other. | Prohibited. | 2 75 | 2 00 |
| Iron—in masses or prisms containing slags (at least 5 pr. ct.) | Prohibited. | 4 50 | 4 50 |
| Drawn, in bars, angle and T-rails, of every dimension. | 12 48 & 17 47 | 6 00 | 6 00 |
| (Fig iron in bars, containing 5 per cent. or more of slag, shall pay the same duty as imported upon prisms still containing slags.) | | | |
| Band and hoop iron—Of more than 1 mm. in thickness. | 13 48 | 6 00 | 6 00 |
| Of 1 mm. or less in thickness. | 17 47 | 7 50 | 7 50 |
| Iron called "ruching," for manufacturing wires. | 12 48 & 17 47 | 6 00 | 6 00 |
| Sheet iron, rolled or hammered, smooth, or more than 1 mm. in thickness—Not cut. | 24 95 | 7 50 | 7 50 |
| Cut, in whatever manner. | 24 95 | 8 25 | 8 00 |
| Sheet iron, thin and black iron plates, smooth, of 1 mm. or less in diameter—Not cut. | 24 95 | 10 00 | 10 00 |
| Cut, in whatever manner. | 24 95 | 11 00 | 11 00 |
| Tin plates, galvanized or coated with copper, zinc or lead. | 49 92 | 21 00 | 13 00 |
| Iron wire, coated or not, with tin, copper or lead—Not more than 5 mm. in diameter. | 37 44 | 10 00 | 10 00 |
| Over 5 mm. in diameter. | 37 44 | 6 00 | 6 00 |
| Steel in bars—Rails. | 37 44 | 9 00 | 5 00 |
| Other, all kinds and hoop and band steel. | 37 44 | 9 00 | 9 00 |
| Steel, brown, in sheets or plates, rolled, when heated, of more than 1 mm. in thickness—Not cut. | 62 40 | 11 25 | 9 00 |
| Cut, in whatever manner. | 62 40 | 11 25 | 9 00 |
| Of 1/2 mm. or less in thickness—Not cut. | 93 60 & 137 28 | 15 00 | 14 00 |
| Cut, in whatever manner. | 93 60 & 137 28 | 15 00 | 16 50 |
| Steel, white, in sheets or plates, rolled when cold, of whatever thickness—Not cut. | 93 60 | 15 00 | 11 00 |
| Cut, in whatever manner. | 137 28 (A) | 15 00 | 16 50 |
| Steel wire for chords of instruments. | 87 35 | 20 00 | 20 00 |
| Old and scrap iron. | 9 08 | 2 75 | 2 00 |
| Iron dross and slag. | 4 09 | 2 00 | 2 00 |
| Copper, pure or alloyed with zinc or tin—Rolled or hammered, in bars or plates. | 15 50 | 10 00 | 10 00 |
| Wires of whatever size, polished or not, but neither gilt nor silver. | 104 & 124 80 | 10 00 | 10 00 |
| Wires, polished (other than for chords of instruments). | Prohibited. | 10 00 | 10 00 |
| Copper, gilt or silvered, in masses or ingots, hammered, drawn or rolled, spun with thread or silk. | 104 00 | 100 00 | 100 00 |
| Lead, alloyed with antimony, in masses. | 32 45 | 3 00 | 3 00 |
| Lead, hammered or rolled. | 32 45 (B) | 3 00 | 3 00 |
| Tin, alloyed with antimony (brittania metal) in blocks. | 71 88 | 8 00 | 8 00 |
| Tin, pure or alloyed, hammered or rolled. | 62 40 | 4 00 | 4 00 |
| Zinc, rolled. | 124 80 | 10 00 | 10 00 |
| Nickel, pure or alloyed with other metals, hammered, rolled, or drawn. | 1 25 | Free. | Free. |
| Mercury, native. | 7 23 | Free. | Free. |
| Antimony, sulphuretted, or of, or smelted. | 32 45 | 8 00 | 6 00 |
| Antimony, metallic, or regulus of. | 2 50 | Free. | Free. |
| Cadmium, crude, or in powder. | 37 44 & 249 60 & 374 40 | Free. | Free. |
| Cobalt, in mass or in powder. | | | |
| Engines and Machinery Complete. | | | |
| Steam machinery—Stationary. | 35 20 | 6 00 | 6 00 |
| For navigation. | 43 68 | 12 00 | 12 00 |
| Locomotives. | 40 00 | 10 00 | 10 00 |
| Other than steam machinery—Engine tenders. | 37 47 & 74 88 | 8 00 | 8 00 |
| Card and plate setting machines. | 24 95 & 51 12 | 6 00 | 6 00 |
| Carding machines not furnished with cards. | 35 44 | 10 00 | 10 00 |
| Machines for cleaning, scouring and cutting the flax, wool, cotton and other textile substances. | 24 95 to 81 72 | 6 00 | 6 00 |
| Spinning machines. | 40 00 | 10 00 | 10 00 |
| Weaver's looms. | 18 72 | 6 00 | 6 00 |
| Bobinet machines. | 74 88 | 20 00 | 10 00 |
| Paper-making machines. | 37 44 | 6 00 | 6 00 |
| Printing machines. | 37 44 | 6 00 | 6 00 |
| Agricultural machines (motors not included). | 13 79 | 6 00 | 6 00 |
| Steam boilers, sheet iron—cylindrical or spherical, with or without flues or fire pipes. | 37 44 | 8 00 | 8 00 |
| Steam boilers, sheet iron—tubular, with tubes of wrought iron, copper or brass, or of riveted sheet iron, or any other boilers, neither spherical nor cylindrical, plain. | 37 44 | 12 00 | 12 00 |
| Steam boilers, cast-steel plates, all forms. | Prohibited. | 25 00 | 25 00 |
| Gasometers, stores, calorifiers, in sheet iron, or part cast iron and part sheet iron. | 37 44 | 8 00 | 8 00 |
| Open boilers, in sheet iron, or part cast iron and part sheet iron. | Prohibited. | 8 00 | 8 00 |
| Copper boilers and apparatus for sugar works for distilling and heating purposes. | 74 88 | 10 00 | 10 00 |
| Sewing machines. | Same as on mach. not denom. | Same as on mach. not denom. | 0 00 |
| Machines tools, and other machines not denominated, of which sheet iron is a component, at the rate of: | | | |
| 75 per cent. or more. | 24 95 to 10 00 | 6 00 | 6 00 |
| Less than 75 per cent. and not less than 50 per cent. | 10 00 to 25 00 | 10 00 | 10 00 |
| Less than 50 per cent. | 10 00 to 25 00 | 15 00 | 15 00 |
| Separate Parts of Machinery. | | | |
| Sheets and filets for cards—Furnished with teeth. | 249 60 | 50 00 | 50 00 |
| Not furnished with teeth. | | | |
| Dents or teeth of reeds, reeds, combs and mountings for looms (iron or copper). | 249 60 | 30 00 | 30 00 |
| Separate parts of machinery, made of cast iron, polished and adjusted. | 18 72 to 249 60 as to wt. | 6 00 | 6 00 |
| Of forged iron—Polished, filed, and adjusted or not adjusted of whatever weight (including axle-trees, springs and tires). | 74 88 to 124 80 | 20 00 | 10 00 |
| Of tilted steel, polished, filed, adjusted or not adjusted—Weighing more than 1 kg. | 187 20 | 11 00 & 15 00 | 10 00 |
| Weighing 1 kg. or less. | 187 20 | 20 00 | 20 00 |
| Of copper, pure or alloyed. | 249 60 | 20 00 | 20 00 |
| Tools, helved or not, pure iron, steel, iron, steel or copper. | 62 40 to 249 60 | 10 00 to 20 00 | 10 00 to 20 00 |
| Printing types, new, and clichés, engraved or not engraved. | 62 40 to 249 60 (6) | 8 00 | 8 00 |
| Stereotypes and coins, engraved for printing on paper. | 18 72 ad va. | Free. | Free. |
| Wire cloth and metallic gauze—Iron or steel. | 93 60 to 187 20 | 10 00 | 10 00 |
| Copper or brass. | 187 20 | 30 00 | 30 00 |
| Needles—Having in length less than 5 cm. | 906 40 | 20 00 | 24 00 |
| Having in length 5 cm. or more. | 249 60 & 524 | 100 00 | 124 00 |
| Knitting needles, crochets, and other similar objects not mentioned (steel, iron or copper). | 124 80 & 249 60 | 14 15 & 20 00 | 25 00 |
| Finis. | 124 80 & 249 60 | 50 00 | 50 00 |
| Pins, metallic, other than gold or silver. | 249 60 | 50 00 | 50 00 |
| Cutlery, common. | Prohibited. | 15 00 & ad va | 100 00 |
| Copper cylinders for printing, engraved or not engraved. | 18 72 & ad va | 15 00 | 15 00 |
| Iron castings, all manufactures of. | Prohibited. | 3 00 to 10 00 | 3 00 to 10 00 |
| Iron, manufactures of, ironmongery, hardware, locksmith works. | Prohibited. | 8 00 & 12 00 | 8 00 & 12 00 |
| Iron—Anchors. | 12 48 | 8 00 | 8 00 |
| Cables. | 18 72 | 8 00 | 8 00 |
| Chains. | 46 80 | 8 00 | 8 00 |
| Nails, iron—Machine made. | Prohibited. | 8 00 | 8 00 |
| For shoemakers and saddlemakers. | 124 80 | 12 00 | 12 00 |
| Iron, wood screws, eyebolts, ring hooks. | Prohibited. | 8 00 | 12 00 & 20 00 |
| Iron bolts and nuts. | Prohibited. | 8 00 | 8 00 |
| Iron pipes and joinings. | 43 68 & 74 88 | 11 00 & 20 00 | 11 00 & 20 00 |
| Iron, hardware, household articles, &c.—Polished or painted. | Prohibited. | 16 00 | 14 00 |
| Tinned, enameled or varnished. | Prohibited. | 20 00 | 20 00 |
| Steel cables made from steel wire. | Prohibited. | 20 00 | 20 00 |
| Steel, small manufactures of, such as pearl slides, brooches, &c. | Prohibited. | 20 00 | 20 00 |
| Steel, hardware, and all other manufactures articles from pure steel, not otherwise denominated. | Prohibited. | 20 00 | 20 00 |
| Cast iron and iron, manufactures of, not polished, the weight of the iron being less than one-half of the total weight. | Prohibited. | 5 00 | 5 00 |
| Weight of iron being equal or superior to half of the total weight. | Prohibited. | 6 00 | 8 00 |
| Cast iron and iron, manufactures of, polished, enameled or varnished, or ornamented with iron, copper or brass. | Prohibited. | 12 00 | 12 00 |
| Copper, pure or alloyed with zinc or tin, manufactures of—Smith's work. | Prohibited. | 40 00 | 20 00 |
| Works of art, ornaments and other works. | 124 80, 249 60 or prohibit. | 20 00 | 20 00 |
| Lead, pipes and other manufactures of, all kinds. | 20 00 | 3 00 | 3 00 |
| Tin, pure or alloyed with antimony—Vessels and pots. | 124 80 & 249 60 | 30 00 | 30 00 |
| Other ware. | Prohibited. | 30 00 | 30 00 |
| Zinc, manufactures of, all kinds. | Prohibited. | 6 00 | 6 00 |
| Nickel, alloyed with copper or zinc (German silver), manufactures of. | Prohibited. | 100 00 | 100 00 |

Iron.

NEW YORK.

OGDEN & WALLACE,
85, 87, 89 & 91 Elm St., New York.
Iron and Steel

Of every description kept in stock.

Agents for Park Brother & Co.'s
BLACK DIAMOND STEEL.
All sizes of Cast and Machinery Steel constantly on hand.**PIERSON & CO.,**

Established 1790,

24 & 26 Broadway, 77 & 79 New St.

NEW YORK CITY.

Ulster Iron.

All Sizes and Shapes kept in Stock.

ABEEL BROTHERS,

Established 1764 by ABEEL & BYVANCK.

Iron Merchants,

190 South Street and 365 Water, N. Y.

ULSTER IRON

A full assortment of all sizes constantly on hand.

Refined Iron,

Horse-Shoe Iron,

Common Iron,

Band, Hoop and Scroll Iron,

Sheet Iron,

Norway Nail Rods,

Norway Shapes,

Cast, Spring and Tire Steel, etc.

A. R. WHITNEY & CO.,

Manufacturers of and Dealers in

IRONOur specialty is in
Manufacturing Iron Used in the Con-
struction of Fire-Proof Buildings,
Bridges, &c.Agents for Carnegie Bros. & Co., Limited,
Wrought Iron Beams and Channel Iron. Bay
State Iron Co., Boiler Plate and Tank Iron. Nor-
way Steel and Iron Works, Homogeneous Steel
Plates and Compressed Steel Shafting. Glasgow
Tube Works, Boiler Tubes. A. M. Byers & Co.'s
Wrought Iron Pipe. H. F. Nail Co.'s Wire Box
Nails. Altoona Iron Co.'s Refined Bars, Rods,
Hoops, Bands, &c. Hanson Iron Works, Refined
Bars.
Plans and estimates furnished, and contracts
made for erecting Iron Structures of every descrip-
tion. Books containing cuts of all iron made sent
on application by mail.
Sample pieces at office. Please address
58 Hudson Street, New York.**BORDEN & LOVELL,**
Commission Merchants

70 & 71 West St.,

Wm. Borden, }
L. N. Lovell, } New York.

Agents for the sale of

Fall River Iron Co.'s Nails,
Bands, Hoops & Rods.

AND

Borden Mining Company's
Cumberland Coals.**WILLIAM H. WALLACE & CO.,**
IRON MERCHANTS

Cor. Albany & Washington Sts.

NEW YORK CITY.

H. WALLACE. WM. SHEPHERD

DANIEL W. RICHARDS & CO.,

FOREIGN AND DOMESTIC

SCRAP IRON, RAILS, STEEL AND METALS.

Yards and Office, 88 to 96 Mangin St., NEW YORK.

DANIEL W. RICHARDS.

MORTON B. SMITH.

PASSAIC ROLLING MILL CO.,

Manufacture and have always in stock

ROLLED IRON BEAMS,Channels, Angles, Tees, Merchant Bars, Riveted Work, For-
gings, Eye Bars, &c.

PATERSON, N. J.

Room 45, Astor House, New York.

CUT NAILS,**Hot Pressed Nuts, Bolts, Washers, &c.**

DOVER IRON CO.'S

BOILER RIVETS,

Boiler Brace Jaws, Socket Bolts, &c.

FULLER BROTHERS & CO.

139 Greenwich Street, New York

Iron.

NEW YORK.

A. B. Warner & Son,**IRON MERCHANTS,**

28 & 29 West and 52 Washington Sts.

BOILER PLATE,

Boiler Tubes, Angle, Tee & Girder Iron

Boiler and Tank Rivets.

Sole Agents for the celebrated

"Eureka," Pennocks,

"Wawasset," Lukens,

brands of Iron. Also all descriptions of Plate, Sheet,

and tinsmith iron. Special attention to Locomotive

iron. Fire Box Iron a specialty.

ROME MERCHANT IRON MILLS,

ROME, N. Y.,

Manufacturers of the best grade of

Bar Iron, Bands and Fine Hoops.

scrolls, Ovals, Half Ovals, Half Rounds, Hexagon and

Horse Shoe Iron. Also from Charcoal Pig a superior

quality of iron branded J. G. All puddled balls re-

duced by hammer. Orders may be sent to the Mill or

to J. O. CARPENTER, our Agent, at 59 John

Street, New York

SECOND-HAND RAILS
FIT TO RELAY.

500 tons, . . . 35 lbs.

500 tons, . . . 45 lbs.

For sale in lots to suit by

FOX & DRUMMOND,

68 WALL ST., NEW YORK.

MARSHALL LEFFERTS & CO.,

90 Beekman St., New York City,

MANUFACTURER AND DEALER.

Galvanized Sheet Iron,

1st and 2d Qualities.

Galvanized Wire, Telegraph and Fence; Galvanized

Roof and Band Iron, Galvanized Rod and Bar Iron,

Galvanized Nails, Galvanized Chain, Galvanized Iron

Pipe.

Best Charcoal, Best Refined and Common

SHEET IRON.**Plate and Tank Iron,**

C No. 1, C H No. 1, C H No. 2 Flange, Best Flange,

Best Flange Fire Box, Chicago.

BOILER IRON

Stamped and Guaranteed.

All descriptions of Iron Work Galvanized or

Tinned to order.

Price list and quotations sent upon application.

JAMES WILLIAMSON & CO.,

SCOTCH AND AMERICAN

PIG IRON,

No. 69 Wall St., New York.

ULSTER IRON WORKS

90 Broadway, New York.

Tuckerman, Mulligan & Co**CARMICHAEL & EMMENS**

130, 132 & 134 Cedar St., New York.

DEALERS IN

IRON AND STEEL BOILER PLATE.

Lap-Welded Boiler Tubes, &c. &c.

Agent for Otis' celebrated Cast Steel Boiler Plates,

The Cortesville Iron Co. The Laurel Rolling Mills,

and Union Tube Works; Wrought Iron Beams,

Angles, Tees, Rivets, &c.

Iron.

NEW YORK

JOHN W. QUINCY & CO.,

98 William Street, New York.

Anthracite & Charcoal Pig Irons,

Wrought Scrap, Cut Nails, Copper,

BLOCK TIN, LEAD, SPALTER, ANTIMONY, NICKEL, &c.

HARRISON & GILLOON**IRON AND METAL DEALERS,**

55, 56, 57, 58 WATER ST., & 303, 304, 305 CHERRY ST.,

NEW YORK.

have on hand, and offer for sale, the following:

Scotch and American Pig Iron, Wrought, Cast and

Machinery Scrap Iron, Car Wheels, Axles and Heavy

Wrought Iron; also old Copper, Composition, Brass,

Lead, Pewter, Zinc, &c.

OXFORD IRON CO.,

(B. G. CLARKE, Receiver.)

Cut Nails

AND

SPIKES.

J. S. SCRANTON, Sales Agent,

51, 53 and 55 Washington Street,

NEW YORK.

BURDEN'S**HORSE SHOES.****"Burden Best"****Iron****Boiler Rivets.**

The Burden Iron Company

Troy, N. Y.

EGLESTON BROS. & CO.,

166 South Street, } NEW YORK CITY.

267 Front Street, }

BURDEN'S**H. B. & S.**

AND

ULSTER BAR IRON.

All sizes and shapes in stock.

Also Best Grades of

Am. & Eng. Ref'd Iron, Common Iron, &c

VOUGHT & WILLIAMS,

286 & 288 Greenwich Street,

NEW YORK.

Dealers in

BAR IRON AND STEEL,

Tire, Spring, Toe Calk,

MACHINERY AND TOOL STEEL.**ALL BRANDS OF HORSE NAILS,**

Horse Shoes, Rasps and Files,

Bellows, Anvils, Vises, Blowers, Tire Benders,

Upright Drills, Hammers, Sledges, Crow Bars,

Pinchers.

B. F. JUDSON,

Importer of and Dealer in

SCOTCH AND AMERICAN**Pig Iron,**

Wrought & Cast Scrap Iron,

OLD METALS.457 & 459 Water St., }
233 & 235 South St., } NEW YORK.**Manhattan Rolling Mill.****J. LEONARD,**

445 to 451 West St., 177 & 179 Bank St.,

NEW YORK.

Manufacturer of

HORSE SHOE IRON,

Toe Calk Steel,

Rods, Ovals, Half Ovals and Flats.

DANIEL F. COONEY,

(Late of and successor to Jas. H. Holdane & Co.)

55 Washington St., N. Y.

BOILER PLATES & SHEET IRON,

CLAP-WELDED HOILER PLATES,

Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.

Agency for Glasgow Iron Co., Jos. L. Bailey & Co.

Pine Iron Works, Lebanon Rolling Mills, Chester

Pipe and Tube Co., Albany & Rens. Iron & Steel Co.'s

celebrated Boiler Rivets; Homogeneous Steel, Boiler

and Fire Box Plates.

Iron.

PITTSBURGH.

W. D. WOOD & CO.'S**Planished Sheet Iron.**

Patented March 14th, 1865; April 8th, 1873;

Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876.

Guaranteed fully equal in all respects to the

IMPORTED RUSSIA IRON,

and at a much less price.

FOR SALE,

by all the principal

METAL DEALERS

In the Large cities throughout

THE UNITED STATES.

And at their Office.

111 Water Street, PITTSBURGH, PA.

C. KANE,**OLD RAILS, SCRAP IRON, STEEL,****PIC IRON, BLOOMS,****AND ORE.**

PITTSBURGH, PA.

CHARLES HUBBARD,**"Sheridan" & "Leesport****Brands Pig Iron,****WHITE IRON (Anthracite & Bessemer)**

Stock for making strong castings.

"CHARCOAL PIG IRON,"**"Maiden Creek" and "Garrick" brands.**

Favorite brands of Scotch Pig Iron,

In stock and to arrive.

OLD CAR WHEELS, BEST BRANDS.

46 Old St., New York City

Iron.

PITTSBURGH.

**STEEL TOE CALKS.**

Extra Quality Homogeneous Steel

BOILER PLATE**STEEL PLATES,** all descriptions.

Cut Nails and Spikes, Plate and Sheet

Iron, all descriptions.

SHOENBERGER & CO., Pittsburgh, Pa.**KEYSTONE ROLLING MILL, Limited.**

Manufacturers of

IRON

Pittsburgh, - - - Pa.

Bonnell, Botsford & Co.,**Iron, Nails & Spikes.****YOUNGSTOWN, OHIO.****MARSHALL IRON CO.,**

Manufacturers of

Best Charcoal Bloom, Best Refined & Common

SHEET IRON.

Office and Mills,

Newport, Delaware.

Sable Iron and Nail Works.**ZUC & CO.,**

Manufacturers of the Celebrated

Sable Nails

Office and Works,

PITTSBURGH, PA.**LEECHBURG IRON WORKS.****KIRKPATRICK & CO.,**

Manufacturers of all grades of

FINE SHEET IRONS,

(Refined Cold Rolled, Show Card, Stamping, Tea Tray, Polished, Shovel, Ferrule Iron, &c.)

NATURAL GAS USED AS FUEL.

OFFICE, No. 143 First Ave., Pittsburgh, Pa. WORKS, Leechburg, Pa.

CORRUGATED AND CRIMPED IRON**ROOFING & SIDING,**

Iron Buildings, Roofs,

Shutters, Doors, Cornices,

Skylights, Bridges, &c.

MOSELEY IRON BRIDGE AND ROOF CO.,

5 Day Street, New York.

Agency of

N. M. HÖGLUND'S SONS & CO., Stockholm**Swedish & Norway Iron**

of every description. Stock on hand at Boston

New York and Philadelphia. Importation orders a

specialty.

GUSTAF LUNDBERG, 38 Kilby St., Boston**ALBERT POTTS,** Philadelphia Agent, 234 & 236 N.

Front Street.

MOSES GOLDSMITH & SON,

Key Box 156,

CHARLESTON, S. C.

Wholesale dealers in

METALS, IRON, RAGS,

And all kinds of Paper Stock.

We invite correspondence.

MANN & JONES,

4 Hanover St., New York,

GENERAL IRON BROKERS

Iron.
PHILADELPHIA.
Siemens' Regenerative GAS FURNACE.
RICHMOND & POTTS,
119 S. Fourth St. PHILADELPHIA, PA.

Iron.
PHILADELPHIA.
HENRY LEVIS & CO.,
Manufacturers' Agents
For Iron and Steel Rails, Car Wheels, Boiler and Sheet Iron and General Railway Equipments.
Old Rails, Axles, and Wheels bought and sold.
234 S. 4th St., Philadelphia.

The Cambria Iron and Steel Works,
Having enjoyed for over TWENTY-FIVE YEARS the reputation of producing the best quality of
RAILS,
have now an annual capacity of
230,000 Tons of Iron and Steel Rails, Splice Bars, &c.
ADDRESS,
CAMBRIA IRON COMPANY,
No. 218 South 4th Street, Philadelphia.
Or at the Works, **JOHNSTOWN, PA.**
Or **LENOX SMITH,** New York Selling Agent, 46 Pine St., N. Y.

THE PHOENIX IRON CO.,
410 Walnut Street, PHILADELPHIA.
Manufacturers of Wrought Iron
Beams, Deck Beams, Channels, Angle & Tee Bars,
STRAIGHT AND CURVED TO TEMPLATE.
Largely used in the construction of Iron Vessels, Buildings and Bridges.
WROUGHT IRON ROOF TRUSSES, CIRDERS & JOISTS,
and all kinds of Iron Framing used in the construction of Fire Proof Buildings.
PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,
and built up shapes for Iron Bridges.
REFINED BAR, SHAFING, and every variety of SHAPE IRON made to order.
Plans and Specifications furnished. Address **DAVID REEVES, President.**
NEW YORK AGENTS, **MILLIKEN & SMITH,** 95 Liberty Street.
BOSTON AGENTS, **FRED. A. HOUDLETTE & CO.,** 19 Battery-march St.

ALAN WOOD & CO.,
MANUFACTURERS OF
Patent Plinished, Galvanized, Common, Best Refined, Cleaned and Charcoal Bloom
PLATE & SHEET IRON.
No. 519 Arch St., Philadelphia, Pa.
Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack, Tank and Boat Iron; Last, Stamping, Ferrule, Locomotive Headlight and Jacket Iron.

NAILS
JAS. ROWLAND & CO.,
Kensington Iron, Steel & Nail Works,
220 North Delaware Ave., - PHILADELPHIA,
Manufacturers of the
ANVIL BRAND REFINED MERCHANT BAR IRON.
Also, the James Rowland & Co. Kensington ★ Nails, cut from
their Refined Anvil stock. Also, Plow and Cultivator Steel; Skelp
Iron a specialty; also Rounds, Squares, Flats, Bands and Hoop
Iron.

PENCOYD IRON WORKS.
A. & P. ROBERTS & CO.,
Manufacturers of
CAR AXLES.
BAR, ANGLE, TEE AND CHANNEL IRON.
Office, No. 385 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.

QUAKER CITY FACING MILLS,
Pier 45 North Delaware Avenue,
PHILADELPHIA, PA.

Please send for Special Price List of our celebrated Machinery Facings.
Mineral Facing, X Facing, Stove Plate Facing,
IXL Facing, XX Facing, Lead Facing,
Charcoal Facing, Anthracite Facing, Bituminous Facing,
Soapstone Facing, Lehigh Facing, Sea Coal Facing.
MANUFACTURERS OF FOUNDRY SUPPLIES.
Riddles, Shovels, Steel Wire Brushes, Bellows, Screens, Buckets, Bristle Brushes, Mallets, Sand
Sifters, Steel Wheelbarrows, Rammers.
Our increased capacity insures prompt shipment of orders by telegram.
J. W. PAXSON & CO.,
DEALERS IN
MOULDING SAND.

ALLENTOWN ROLLING MILL COMPANY,
Manufacturers of
Rails, Bars, Axles, Shafting, Fish Bars (Plain and Angle), Spikes,
Rivets, Bolts and Nuts, &c. Bridges and Turn Tables.
General Office, 237 South Third St., Philadelphia. Works at Allentown, Pa.

JAMES C. BOOTH. THOMAS H. GARRETT. ANDREW A. BLAIR.
BOOTH, GARRETT & BLAIR,
Analytical and Consulting Chemists,
919 and 921 Chant St. (10th St. above Chestnut St.), PHILADELPHIA, PA.
Established in 1836.
Analyses of Ores, Waters, Metals and Alloys of all kinds. A special department for the
ANALYSIS OF IRON AND STEEL,
fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron Steel, Iron
Ores, Slags, Limestones, Coals, Clays, Fire Sands &c. Agents for sampling ores in New York and
Baltimore. Price lists on application.

Iron.
Edward J. Etting,
IRON BROKER AND COMMISSION MERCHANT,
230 S. Third St., Philadelphia, Pa.
Pig, Bar and Railroad Iron.
OLD RAILS, SCRAP, &c.
Agent for the
MOUNT SAVAGE FIRE BRICK,
The Allentown Iron Co. and
The Coleraine Furnaces.
STORAGE WHARF AND YARD
DELAWARE AVENUE ABOVE CALLOWHILL STREET,
connected by track with railroad.
Cash advances made on iron.

J. Wesley Pullman,
407 Walnut St., Philadelphia,
Exclusive SALES AGENT
Chester Iron Co.'s Blue, Red and Hot
ORES.
Also celebrated "Brotherton" Ore.

D. W. R. READ & CO.,
Importers and dealers in
**FOREIGN & NATIVE
BESSEMER ORES.**
PIG IRON ENGLISH FIRE BRICK.
205 1/2 Walnut St., PHILADELPHIA.
142 Pearl St. 57 Gracechurch St. 67 S. Gay St.
NEW YORK. LONDON. BALTIMORE.

J. J. MOHR,
Sole Agent for
**Sheridan, Leesport, Ring-
gold and Lynchburg,**
**BESSEMER, FOUNDRY AND FORGE
PIG IRON,**
Jefferson and Mt. Penn Cold Blast
Car Wheel Charcoal Pig Iron.
430 Walnut St., PHILADELPHIA, PA.
NORTH BROS.,
23d and Race Sts., Philadelphia.
Fine Light and Medium-Weight GRAY
IRON CASTINGS to order.
Correspondence solicited.

ISAAC V. LLOYD. JAS. G. LINDRAY.
LLOYD & LINDSAY,
No. 328 Walnut St., PHILADELPHIA,
Brokers and General Dealers in
Iron and Steel, Railway Equipments and
Supplies, Bar, Plate and Sheet Iron, Pig
Iron, Rails and Fastenings, Muck Bars,
Blooms, Boiler Tubes, Wrought Iron Pipe, &c.
Old Rails and Scrap Iron.
Florida Yellow Pine, cargo lots.

J. O. RICHARDSON,
IRON COMMISSION MERCHANT,
No. 232 Dock St., Philadelphia.
Pig Iron, Railroad Iron and
Iron Ores.
Sole Agent for the MONOCACY FURNACE CO.
DEALER IN
MOSELEY, ROCKHILL, WARWICK,
And other Favorite Brands.
SILVER GREY IRON A SPECIALTY.

J. W. HOFFMAN & CO.,
Iron Merchants & Railway Equipments.
205 South Fourth St., Philadelphia.
Sole agents Glasgow Iron Co. and Pine Iron Works
manufacturers of Muck Bar and all grades of Plate
Iron. Celebrated "Glasgow" and "Pine"
brands for fire boxes and difficult flanging. Pig and
Bar Iron, Rails and all shapes in iron. Quotations
given on Bridge and Building Specifications.
G. A. HERBERT. S. FRANK SHARPLESS.
HEBERTON & CO.,
Selling Agents and Commission Merchants
For the sale of
**Pig, Bloom, Plate, Bar, Scrap, Galvanized,
Blotch, Sheet, Pipe and Railroad
IRON.**
No. 333 Walnut St., Phila.
Charcoal Bloom and Pig a specialty.

IRON. STEEL.
SCRAP OF ALL KINDS A SPECIALTY.
First Quality Muck Bars.
SHIMER & CO.,
Late of and successors to W. HUTTON & CO.,
250 S. Third St., Philadelphia.
Joseph P. Reed. R. Hope Hepburn.
JOSEPH P. REED & CO.,
Iron Brokers and Commission Merchants,
265 S. Fourth St., Philadelphia.
Sole Agents for
RIDGEVIEW COAL AND COKE CO., Latrobe.
J. D. BOYLE'S CONNELLSVILLE COKE.
HARRISON & WALKER'S FIRE BRICKS.
MAGNETIC and HEMATITE IRON ORES a Specialty.
FRANCIS WISTER,
Sole Eastern Agent for
A. A. HUTCHINSON & BRO.
CONNELLSVILLE COKE.
ORES, Native and Foreign.
230 South Third Street, Philadelphia.

J. F. BAILEY & CO.,
216 South 4th St., Philadelphia. 52 Wall St., (Room 2) New York.
Selling Agents
ATKINS' BRO'S—BEAMS, CHANNELS, RAILS, &c.
**A. & P. Roberts & Co.—Car Axles, Plates, Channels, Tee,
Angle and Bar Iron.**
WILLIAM McILVAIN & SONS—Boiler, Ship and Bridge Plates.
BERWICK R. M. BARS AND SHAPE IRON.
Advances on Consignments of Old Material and sales promptly made.

BRADLEE & CO., 516 Richmond Street, Philadelphia.
Manufacturers of
**Iron Clad Steel Chain and the Celebrated
"D. B. C." Special Crane Chain.**
All Chains carefully tested and examined and certificate of proof
furnished. Dredging, Mining and Crane Chains. Raising Chains.
Tugboat, Eye Bolts and Log Dogs.

CHAINS.

Iron.
JUSTICE COX, JR. CHARLES K. BARNES.
JUSTICE COX, JR. & CO.,
AGENTS FOR
CHICKIES, ST. CHARLES, MONTGOMERY
WARWICK, CONEWAGO AND KEYSTONE
Foundry & Forge Pig Iron.
SHAWNEE ROLLING MILL CO., Limited,
Best Quality Muck Bar.
CATASAUQUA MFG. CO.'S
Bar, Angle, Skelp and Sheet Iron.
Railroad Car Axles. New and Old Rails.
No. 333 Walnut St., Philadelphia.

PETER WRIGHT & SONS,
307 Walnut Street, Philadelphia,
55 Broadway, New York,
44 Second Street, Baltimore,
Importers of
German and English

SPIEGELEISEN,
Pig, Scrap,
**NEW AND OLD RAILS,
And Iron Ore.**

JEROME KEELEY & CO.,
206 Walnut Place, Philadelphia.
SELLING AGENTS FOR
CHARCOAL and ANTHRACITE BLOOMS, PIG IRON,
BAR IRON, SHEET IRON, STEEL and IRON RAILS,
IRON CLAD STEEL RAILS and BARS, MAGNETIC
and HEMATITE IRON ORES, FIRE BRICK, COAL
and OKE. MUCK BARS. Handle Old Iron and Steel
Rails, Scrap Iron, &c. Examine and negotiate sales
of Iron and Coal properties.
E. H. Wilson. A. Kaiser. J. B. M. Hiron

E. H. WILSON & CO.,
230 South Third Street, Philadelphia.
BROKERS AND DEALERS IN
IRON AND STEEL.
Correspondence solicited.

BLAKEY & WALBAUM,
206 S. Fourth St., PHILADELPHIA.
SPECIALTIES:
**NEW AND OLD RAILS,
BLOOMS, BESSEMER PIG,
Spiegeleisen Iron Ores**
AND
Railroad Supplies Generally.

**THE
STANDARD
STEEL
WORKS.**

LOCOMOTIVE AND CAR WHEEL TIRES,
Manufactured from the celebrated OTIS STEEL.
BRAND
STANDARD.
Quality and efficiency fully guaranteed. Prices as
low as any of the same quality. We manufacture
Heavy and Light Forgings, Driving and Car Axles,
Crank Pins, Piston Rods, &c.
Works at Lewistown, Pa.
Office, 220 S. 4th St., Philadelphia, Pa.

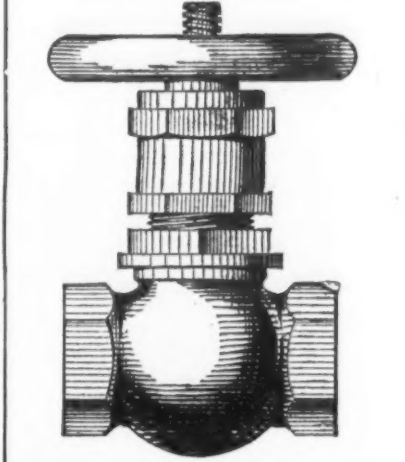
LANGHORNE WISTER. RODMAN WISTER.
L. & R. WISTER,
IRON BROKERS.
Agents for the Clearfield Fire Brick Co.'s
Fire Bricks.
No. 230 South 4th St., Philadelphia.

KEYSTONE HORSE SHOE CO.,
17th and Clearfield Sts., Philadelphia, Pa.
Manufacturers of the Keystone Patent Solid
Steel Calk Horse and Mule Shoes.
These Shoes are made of superior iron and steel,
completely finished and ready for cold shoeing;
have clip and solid steel calks. The holes are
punched through at the proper angle and free
from burrs. Same number of Shoes per keg as in
kegs of unfinished shoes.

KEYSTONE HORSE SHOE CO.,
17th and Clearfield Sts., Philadelphia, Pa.
Manufacturers of the Keystone Patent Solid
Steel Calk Horse and Mule Shoes.
These Shoes are made of superior iron and steel,
completely finished and ready for cold shoeing;
have clip and solid steel calks. The holes are
punched through at the proper angle and free
from burrs. Same number of Shoes per keg as in
kegs of unfinished shoes.

BRADLEE & CO., 516 Richmond Street, Philadelphia.
Manufacturers of
**Iron Clad Steel Chain and the Celebrated
"D. B. C." Special Crane Chain.**
All Chains carefully tested and examined and certificate of proof
furnished. Dredging, Mining and Crane Chains. Raising Chains.
Tugboat, Eye Bolts and Log Dogs.

Haas' Improved Stop Valve.
Mr. William Haas, of this city, has in-
vented an improved stop-valve, which we
here illustrate, and which, though perhaps
familiar in appearance to many of our
readers, possesses peculiar advantages worthy
of note. In most valves of this kind the
valve proper in descending or ascending re-
ceives a rotary motion, causing considerable
friction when coming in contact with the
seat, and ultimately resulting in leakage.
Mr. Haas has given attention to this im-
portant defect, and has so constructed his
valve that the rotary motion is entirely dis-
pensed with, the opening and closing being
effected by a movement similar to that of
piston valves. The hand-wheel, as shown,
is provided with an internal screw-thread to
receive the end of the valve-stem, and with
a guide-tube extending over the smooth
portion of the stem and into a cavity in the
shell of the valve. This guide-tube is com-



Improved Stop Valve.—Fig. 1.—Side Elevation.

bined with a cap which catches over a
shoulder formed on the outer end of the
tube, and which may be screwed on the neck
of the valve-casing. The valve-stem is pro-
vided with a key, which prevents it from
rotating when the guide-tube is turned, this
latter operation causing the valve to ap-
proach or recede from its seat. Should it
become necessary to refit the valve, the key
may be removed and the valve ground on its

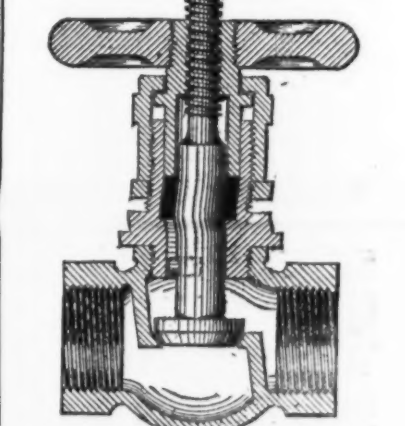


Fig. 2.—Sectional View.

seat without difficulty. The guide-tube may
be adjusted in the correct position by screw-
ing down the cap previously mentioned and
retaining it in its place by means of a jam-
nut. This also prevents it from being turned
by the friction of the guide-tube whenever
this is rotated either to open or close the
valve. It will readily be seen that Mr. Haas'
ingenious arrangement removes all objec-
tions to which valves hitherto have been
open, constant refitting as well as the escape
of steam, water or other fluid being entirely
avoided. Messrs. Wm. Haas & Co., of 57
Grand street, this city, are prepared to fur-
nish these valves in various sizes upon appli-
cation.

Railroads Sold Under Foreclosure in 1881.

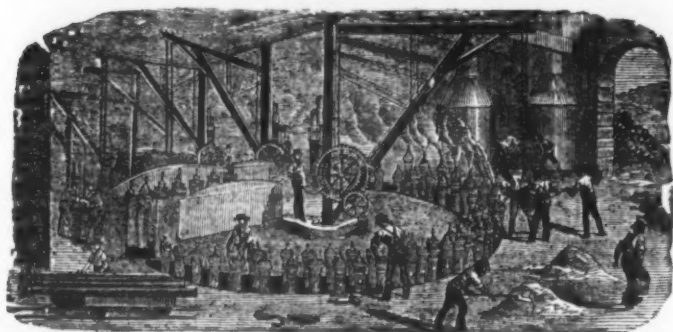
The Chicago Railway Age, in its annual
recapitulation on the subject, announces that
twenty-nine railroads, with an aggregate
mileage of 2617 miles, and with an appar-
ent investment of \$51,277,600 in capital
stock and \$76,644,900 in bonds and other in-
debtedness, making a total of \$127,922,500,
have been sold during 1881, to wind up
their long outstanding obligations. In a few
cases the figures are estimated, but the
totals are probably rather under than over
the exact facts, as in most cases the state-
ment of bonds and debt does not include ac-
crued interest:

| Name of road. | Capital stock. | Bonds and debt. |
|--------------------------------|----------------|-----------------|
| Adirondack..... | \$4,250,000 | \$7,117,724 |
| Atl. Gulf & W. In. Transit | 3,000,000 | 2,000,000 |
| Atlantic, Miss. and Ohio..... | 7,121,000 | 18,000,000 |
| Bingham Canon and Camp | | |
| Floyd..... | 200,000 | 200,000 |
| Cent. Ex. Long Island..... | 150,000 | 150,000 |
| Calro and St. Louis..... | 5,000,000 | 5,415,000 |
| Chicago, Peikin and S. W..... | 826,500 | 1,826,000 |
| Cleve'd, Mt. Ver. & Del..... | 1,318,154 | 4,512,757 |
| Detroit and Bay City..... | 1,248,750 | 3,701,000 |
| Farmington and Lowell..... | 122,000 | 1,145,800 |
| Flush. N. Shore and Cent..... | 815,000 | 1,500,000 |
| Fl. Wayne, Muncie & Cin..... | 1,000,000 | 3,850,000 |
| Greene Bay and Minn..... | 7,000,000 | 6,900,000 |
| Galveston, Brazos and Col..... | 100,000 | 100,000 |
| Hanover Junc. and Sus..... | 150,000 | 79,169 |
| Lawrens..... | 600,000 | 300,000 |
| Levin and Kennecob..... | 1,083,024 | 656,950 |
| Manchester and Keene..... | 301,694 | 607,814 |
| Memphis, Paducah and N..... | 3,000,000 | 3,157,203 |
| Milwaukee and Northern..... | 2,200,000 | 2,155,000 |
| New Castle and Franklin..... | 330,474 | 750,000 |
| Petersburg..... | 1,324,800 | 1,487,223 |
| Peabottom..... | 225,000 | 624,108 |
| Rochester and State Line..... | 22,004 | 2,215,778 |
| Rhinebeck and Conn..... | 670,300 | 999,595 |
| Spartanburg & Asherv'le | 1,000,000 | 1,120,000 |
| South Carolina..... | 5,810,275 | 6,345,575 |
| Santa Cruz..... | 300,000 | 300,000 |
| Texas Western..... | 400,000 | 300,000 |
| Total (29 roads)..... | \$51,277,600 | \$76,644,900 |

The Railway Age remarks that the past
year has been one of such general prosperity,

A. H. McNEAL,

BURLINGTON, N. J.



Flange Pipes.

General Foundry Work.

CAST IRON PIPES

FOR WATER AND GAS.

ESTABLISHED IN 1848.

SINGER, NIMICK & CO., Limited,

PITTSBURGH, PA.

MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

STEEL,

Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Muley, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Rollers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface and exactness of gauge.

ROUND MACHINERY CAST STEEL

For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Plug Steel.

"Iron Center" Cast Plug Steel. Finished Rolling Plug Couplers with Patent Screw Hubs attached. Agricultural Steel cut to any pattern desired. Steel Forgings made to order.

Represented at 59 Beekman St., New York, and 417 Commerce St., Philadelphia, by HOGAN & BURROWS, Gen'l Agents for Eastern and New England States.

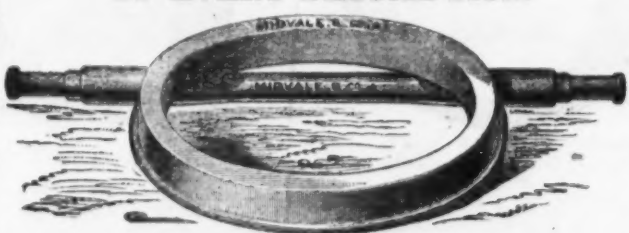
THE MIDVALE STEEL COMPANY,

CRUCIBLE AND OPEN-HEARTH STEEL.

TIRES and AXLES

OF EVERY DESCRIPTION.

A. G. TOMPkins & Co., Boston.
H. A. BOGGER, New York.
W. H. WALLACE & Co., New York.
MANNING, MAXWELL & MOORE, New York.



CRUICKSHANK & CO., Chicago.
PORT & CO., Cincinnati.
H. & A. C. SENEFF, Louisville.
H. LINLEY, St. Louis.
SMITH & HADY, Richmond.

Tool, Machinery and Spring Steel Castings and Forgings.

Works and Office,

Warehouse,

Nicetown, Philadelphia, Pa.

12 N. 5th St., Philadelphia, Pa.

STEEL FORGINGS

Of all Descriptions.

Address orders to

THE PHILADELPHIA STEEL FORGE, Office, Frankford, Philadelphia, Pa.

GENERAL WESTERN AGENTS,

CHAS. I. WICKERSHAM, & CO., No. 154 Lake Street, Chicago.

ESTABLISHED 1847.

A. WHITNEY & SONS,

PHILADELPHIA.

CHILLED RAILROAD WHEELS

For every kind of service, including Street, Mine and Lumber Tramways. Wheels furnished in rough bored or on axles. Chilled castings made to order.

PENNSYLVANIA STEEL COMPANY,

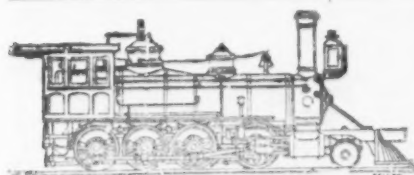
Steel Rails, Frogs, Crossings & Switches.

Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.

Works at Baldwin Station, Pennsylvania Railroad, near Harrisburg, Pa.

Address all orders to

PENNSYLVANIA STEEL COMPANY, 208 South Fourth Street, Philadelphia.



BALDWIN LOCOMOTIVE WORKS,

BURNHAM, PARRY, WILLIAMS & CO., Proprietors,

Philadelphia, Pa., U. S. A.

Manufacturers of

LOCOMOTIVE ENGINES

of every Description.

Catalogues, photographs and estimates furnished on application of customers.

NOISELESS STEAM MOTORS,

For city and suburban Railways.

These machines are nearly noiseless in operation; show no smoke with the use of anthracite coal or coke as fuel, and show no steam whatever under ordinary conditions of service. They can be run at two or three times the speed of horse-

cars and draw additional cars. Circulars with full particulars supplied.

ROANE IRON COMPANY,

Manufacturers of and Dealers in

Pig and Railroad Iron.

CHATTANOOGA, - - - - - TENN.

L. HERNSHEIM,

Manufacturers' Agent and Commission Merchant,

105 JOHN ST., NEW YORK.

STEEL RAILS, ENGLISH BESSEMER PIG IRON,
STEEL BLOOMS, FERROMANGANESE,
STEEL WIRE RODS, SPIEGEL IRON,
OLD & NEW IRON RAILS, AUSTRIAN CHARCOAL PIG IRON.

BRITTON IRON AND STEEL CO.,

MANUFACTURERS OF

IRON AND STEEL BOILER PLATE,

Tank, Bridge and Ship Plates,

BLACK AND GALVANIZED SHEET IRON.

Works foot of Wason St., cor. L. S. & M. S. R. R. CLEVELAND, O.

JACKSON IRON COMPANY,

Manufacturers of Fayette Pig Iron (L. S. Charcoal), Stewart Pig Iron (Bituminous Coal and Coke), Also, Hammered Blooms, Billets and Muck Bar, extra low in phosphorus, for Siemens-Martin and Crucible Steel. Miners of Jackson (Lake Superior) Iron Ores. FAYETTE BROWN, Gen. Agent. HARVEY H. BROWN, Asst. Gen. Agent. Offices, 130 Water St.

HARVEY H. BROWN & CO.,

AGENTS

CHAMPION IRON CO., LAKE SUPERIOR IRON CO. } Lake Superior Iron Ores.

Dealers in Pig Iron, Iron Ores and Old Rails.

Offices, 130 Water Street, CLEVELAND, OHIO.

ORFORD NICKEL AND COPPER COMPANY,

SMELTERS AND REFINERS OF COPPER.

THOS. J. POPE & BRO., Agents, 292 Pearl St., New York.

Copper Ore, Mattes or Bullion purchased. Advances made on consignments for refining and sale. Smelting and Refining Works at Bergen Point, near New York. Offices, 292 Pearl St., New York.

CHARLES HUBBARD, 46 Cliff St., New York City

HEAVY STEEL AND IRON FORGINGS,

For Marine and Stationary Engines.

Homogeneous Steel Boiler Plate, "Nashua" Brand.

Best YORKSHIRE BAR, "TAYLOR" IRON, for Stamped Work, Screws, etc., etc.

MUSKET SPECIAL TOOL STEEL, requires neither tempering nor hardening.

Estimates given.

TO THE TRADE:



STANDARD KELLY WIRE, BARBS AT 5 INCH SPACES.

THE OLD RELIABLE

KELLY STEEL BARB WIRE!

IS THE BEST.

We do not sell to jobbers, and want but ONE RELIABLE DEALER in each town. Correspondence solicited. Prices, samples, etc., sent on application.

THORN WIRE HEDGE CO., Sole Mfrs.,

15 to 21 N. Clinton Street, Chicago, Ill.

IRON AND STEEL DROP FORGINGS

All shapes, small and large, including Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of Bricklayers', Moulders', and Plasterers' Tools, Saddlers' Round and Head Knives.

WILLIAM ROSE & BROS.,

36th & Filbert Sts., West Philadelphia.

HOOPE & MERRY,

WEST SIDE GALVANIZING WORKS,

537 to 547 West 15th Street, New York.

Manufacturers of

The "Lion" and "Phoenix" Brands of Galvanized Sheet Iron. Corrugated Iron for Roofing or Siding, Tin Plates, Solder, Slatting and Roofing Nails, Tinned, Galvanized and Black. All kinds of Ironwork Galvanized or Tinned to order.

BIRMINGHAM ROLLING MILL CO.,

MANUFACTURERS OF

BAR, BAND AND HOOP IRON,

T-RAILS AND SPLICE BARS.

Also, Street and Tram Rails.

Birmingham, Alabama. Head Office, Louisville, Ky.

We solicit inquiries for Bar Iron and small Rails. Orders filled promptly.

C. W. LEAVITT, 137 Broadway, Room A, 2d Floor, New York.

NEW AND OLD

RAILS AND RAILWAY EQUIPMENT.

General Agent ALLENTOWN ROLLING MILLS. Agent for PARDEE CAR & MACHINE WORKS.

CALUMET IRON & STEEL CO.,

MANUFACTURERS OF

PIG IRON, MERCHANT BAR, IRON AND NAILS.

57 DEARBORN STREET, CHICAGO,

C. R. CUMMINGS, President.
D. C. BRADLEY, Vice Pres. and Gen'l Man.
CHARLES D. RHODES, Treasurer.
FRANCIS W. NEWLAND, Secretary.

Works, Irondale, Cook Co., Ill.

CHAS. G. LUNDELL,

No. 7 Exchange Place,

BOSTON,

Mass.

REPRESENTING
SWEDISH IRON
Ekman & Co.
GOTHENBURG,
SWEDEN.

WROUGHT IRON

Boiler Tubes,

Steam, Gas and Water Pipe.

Oil Well Tubing, Casing and

LINE PIPE.

Cotton Presses, Forgings,

ROLLING MILL AND

General Machinery.

READING IRON WORKS,

261 S. Fourth St. Philadelphia.

BROWN & BROTHERS,

81 Chambers St., N. Y. Waterbury, Conn.

MANUFACTURERS OF

BRASS, COPPER AND GERMAN SILVER,

In Sheets, Rolls, Rods, Wire, Tubing, Rivets, and Burs, Etc.

ALSO,

Seamless Brass & Copper Tubing.

PATENTED SEAMLESS BRASS AND COPPER HOUSE BOILERS, warranted to stand 200 lbs. pressure and guaranteed against vacuum.

PATENTED SPRING TEMPERED SHANK SILVER-PLATED, FLAT TABLE WARE, in rich designs.

GERMAN SILVER SPOONS AND FORKS.



Established 1837.

A. PURVES & SON,

Dealers in

Scrap Iron, Metals and Machinery

Cor. South and Penn Sts., Philadelphia.

Offer for sale in large or small lots, quantities to suit. Old Machinery, Red Scrap Brass (selected), Old heavy Yellow Scrap Brass, Ingot Red Brass (best quality), Ingot Yellow Brass, Ingot Gun Metal made strictly from old cannon.

S. CHENEY & SON

Manlius, N. Y.,

Small Gray Iron Castings.

We warrant our work for smoothness and finish.

JNO. J. SHIPHERD,

INVESTMENT BANKER,

And Dealer in

Lake Superior Iron Mining Stocks,

CLEVELAND, OHIO.

Correspondence solicited.

JOHN E. SWAN & BROS., Ltd.,

IRON MERCHANTS

Glasgow and Middlesbrough,

Exporters of all brands of

Scotch & English Pig Iron.

c. f. i. to America — f. o. b. British ports.

Old Iron Rails, Puddled Bars

AND MANUFACTURED IRON.



WM. McFARLAND,

Iron and Brass Founder,

TRENTON, N. J.

Chilled Cast Wire Dies a Specialty.

Any size or style made at short notice.

WEEKS' SCALE WORKS



MANUFACTURERS OF
Weeks' Patent Combination Beam
U. S. STANDARD SCALES,
562 WASHINGTON ST., BUFFALO, N. Y.
No Weights to be Lost or Stolen.
Price of 3-ton platform 7x14 ft. \$55.00
Price of 4-ton platform 8x14 ft. 65.00
Accuracy and Durability Guaranteed.
WEEKS & RAY, Proprietors.


Gilbert & Bennett Mfg. Co.,
GEORGETOWN CONN.,
MANUFACTURERS OF
**IRON WIRE, SIEVES AND
WIRE CLOTH,**
Power Loom Painted Screen Wire Cloth,
GILBERT'S RIVAL ASH SIEVE
Galvanized Twist Wire Netting,
THE UNION METALLIC CLOTHES LINE WIRE.
Warehouse, - 49 Cliff St., New York.

John Maxheimer,
Manufacturer of
Patented
**BRASS, BRIGHT
TINNED WIRE
& JAPANNED
Bird Cages.**
The cheapest and most
saleable in market.
Catalogues and Price
Lists furnished to the
Trade.
247 & 249 Pearl St.,
New York.



RUMSEY & CO.,
Seneca Falls, N. Y., U. S. A.,
Manufacturers of
**500 STYLES OF HAND AND POWER
PUMPS,**
FOR ALL PURPOSES AND USES.
Also,
**HAND FIRE
ENGINES.**

Illustrated catalogues fur-
nished upon application.
Factories, **SENECA
FALLS, N. Y.** Ware-
house, 93 Liberty St.,
New York City. L. M.
RUMSEY & CO., Agents,
St. Louis, Mo. BRINT-
NALL, LAM & CO., Agents,
Chicago, Ill. MARCUS C.
HAWLEY & CO., Agents,
San Francisco, Cal. JUST-
US SCHMIDT, Agent,
Hamburg, Germany.



DUNBAR BROS.,
Manufacturers of
Clock Springs and Small Springs
of every description, from best Cast Steel
BRISTOL, CONN.




Schenectady Molding Sand Co.
**ALBANY AND SCHENECTADY
MOLDING SAND**
delivered on cars or boats at low rates. All grades
guaranteed. All orders will receive prompt atten-
tion. Address, **J. G. GREENE, Sec.,**
23 Wall St., SCHENECTADY, N. Y.
G. S. VEEDER, Pres.; J. G. GREENE, Sec. and Treas.

FOR SALE.
200 Sets Steel Stamping Figures and
Alphabets, Fully Warranted.
Gothic Figures, 1/4 in. or less, \$1 per set; 3/16 in.,
\$1.50; 1/2 in., \$2.50; 5/8 in., \$3.50 per set.
Alphabets three times as much. Old stamps
repaired and new ones made promptly. Send for
price list. **CLEVELAND STAMP AND DIE CO.,**
125 Champlain st., Cleveland, Ohio.

CLOTHES WRINGERS.
Self-adjusting
Steel Knappe Springs.
**"EUREKA"
WRINGER.**
BOSTON.
T. J. ALEXANDER, Manager,
BOSTON, MASS.



H. WEINDEL,
405 North Fourth St., PHILADELPHIA,
Makes a Full Line of
HAND AIR PUMPS,
(Fly-wheels and Improved
Crank Motion.)
Also, manufacturer of the easy
running Pendulum pumps for small
power.


The above cuts (Fig. 25) represent our **PATENT AQUAPULT**, so valuable a Hand Force Pump that certain competitors have made bold to infringe on same, and even to resort to the crime of plagiarizing in using our cuts and trade-mark name of article to decoy customers away from our manufacture and invention; and we caution the trade and customers against purchasing this article when not made by ourselves, as we intend to protect our rights under our patent.

**WE ARE THE ORIGINAL AND FIRST INVENTORS OF THIS STYLE
OF PUMP, AND HOLD VALID LETTERS PATENT ON SAME, AND ANY
STATEMENT THAT IT HAD BEEN IN THE MARKET PREVIOUS TO OUR
MANUFACTURE OF SAME IS OF COURSE ABSURD AND WITHOUT THE
SLIGHTEST FOUNDATION IN TRUTH.**
W. & B. DOUGLAS, Middletown, Conn.
BRANCH WAREHOUSES:
85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.

UNION MANUFACTURING CO.
Sole Manufacturers of
**SKINNER'S PATENT
COMBINATION CHUCK.**
Universal, Independent and Eccentric.
By sliding a stud on the back of chuck it is instantly
changed from Universal to Independent, and vice versa.
Each Chuck is guaranteed perfect. All parts
are made interchangeable. Only the very best mate-
rials used in their construction. Reversible or special
jaws furnished when desired.
We also manufacture
Plain and Ornamental Butts,
Single and Double Acting Spring Hinges,
Union Coil Door Springs,
Galvanized Pump Chain,
Patent Rubber Buckets,*
Wooden Well Curbs, Wood Tubing,
Iron and Brass Pumps,
Patent Copper Pumps,
Hydraulic Rams, Power Pumps,
&c., &c., &c.
Write us for prices.
Union Manufacturing Co.,
Warehouse, 96 Chambers St., New York. NEW BRITAIN, CONN.



This Advertisement Changed Weekly.
IOWA BARB WIRE CO.,
99 John St., NEW YORK. 89 Lake St., CHICAGO.
STAUFFER, MACREAY & CO., New Orleans, La.
IOWA RING STRETCHER.



Shown as in Actual Use.

JAMES W. ROSS,
IMPORTER OF AND FURNACE AGENT FOR
SCOTCH AND AMERICAN PIG IRON.
MANUFACTURERS' AGENT OF
Bar Iron, Car Wheels, Axles, Rails and Railroad Supplies.
SOLE AGENT
WHITAKER IRON COMPANY,
OF WHEELING, W. VA., MANUFACTURERS OF
SHEET IRON, TANK AND FIRE BED,
36 DEARBORN STREET, CHICAGO.

NATIONAL HARDWARE & MALLEABLE IRON WORKS,
Lehigh Avenue, American and Third Streets, Philadelphia.
THOMAS DEVLIN & CO.,
MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS made from patterns to
order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line
of Carriage and Wagon Castings constantly on hand for the trade.

BRIDGEWATER IRON CO., Bridgewater, Mass.
Manufacturers of
SEAMLESS DRAWN BRASS & COPPER TUBES,
BRIDGEWATER HORSE NAILS, 3d. FINE NAILS,
Tack Plates and Forgings of Every Description.
MAHUM STETSON, Jr., Agent, 73 Pearl Street, New York.

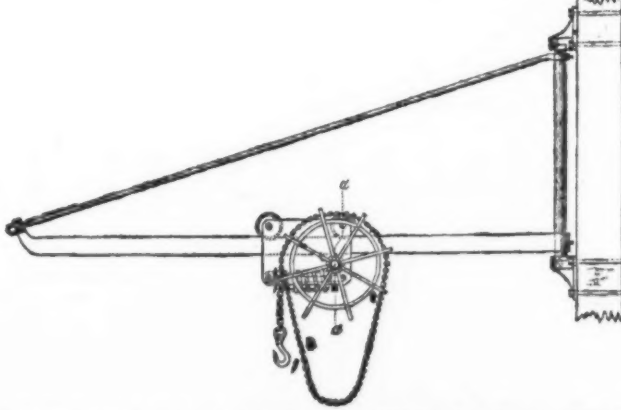
and capital has been invested so lavishly in new railway enterprises, that the general impression doubtless has been that the era of railway foreclosures was ended, and these totals will be not only surprising, but perhaps discouraging to some. It should be remembered, however, that the bankruptcy of these roads commenced years ago, and that they have been dragging along through the slow process of receiverships and foreclosures until the inevitable though long-deferred result of sale and reorganization. The creditors of these companies, however, have shared in the increased prosperity of the country by being able to obtain far better terms at the sale of the roads than they could have obtained a very few years ago, so that the law's delays in their cases have generally proved, in the long run, advantageous. The following is a summary of the record of foreclosures for the past six years:

| Years. | No. Roads. | Mileage. | Capital. |
|------------|------------|----------|-----------------|
| 1876..... | 30 | 3,846 | \$17,848,000 |
| 1877..... | 54 | 3,875 | 198,084,000 |
| 1878..... | 48 | 3,903 | 311,631,000 |
| 1879..... | 65 | 4,909 | 443,288,000 |
| 1880..... | 31 | 3,775 | 263,882,000 |
| 1881..... | 29 | 2,617 | 127,923,000 |
| Total..... | 257 | 22,024 | \$1,363,556,000 |

From this it appears that during the past six years 257 roads, with a mileage of nearly 23,000 miles and a nominal capital investment of about \$1,364,000,000, have passed from the hands of the original owners by means of bankruptcy foreclosures proceedings. This represents something over 20 per cent. of the total mileage and of the total reported railway capital of the country in 1881.

Small Jib Crane.
Messrs. Jones & Laughlin, of Pittsburgh, are using in their shops and are manufacturing for the trade, a worm hoist mounted and traveling freely on a jib, the general features of which are shown in the accompanying engraving. It is quick in its action and easily operated by one man. It is powerful, simple, durable and quite convenient. It will raise and hold securely at any point within the radius of the arm, a weight from one

which had begun about three years ago in the United States, was steadily pervading other countries, thus giving promise of very large requirements. This inference was strengthened by the continued revival in the trade, which, although retarded by an interval of intense cold during January and February, made almost uninterrupted advances. All the large railways are replenishing their lines, which during adverse times they were unable to do, and leading steamship companies and private owners are adding rapidly to their tonnage. There has not been much alteration in the production, makers continuing to act on the principle of improving their furnaces as circumstances permit. There are 148 furnaces built at this date, against 152 in 1880, of which 96 are making about 18,700 tons weekly of good merchantable qualities, or, say, 195 tons per furnace; and 9 are producing 2500 tons hematite, or at the rate of 280 tons per furnace. The average number of furnaces blowing since Christmas, 1880, was 116, producing 1,176,000 tons, as compared with 106, producing 1,049,000 tons during the corresponding period last year, or about 127,000 tons more. A little cold blast and silicious pig iron has also been made, but high grades have not developed much this year, although there is a disproportionate stock of G. M. B. in the hands of our storekeepers, which is causing several producers to consider the advisability of making more hematite for immediate consumption, rather than a class of iron which hangs like an incubus over the market, entirely under the control of speculators. The foundries connected with marine engineering have had full employment throughout, but orders for general castings were not so numerous as could be desired, although some heavy contracts were secured recently, and inquiries are now more satisfactory. The iron and steel rolling mills have turned out large quantities, and are in many instances unable to entertain more work, having already as much on hand as they can manage. The consumption of pig iron amounted to about 98,000 tons more than in 1880, and if we assume that this occurred during the last six months, it gives no less than about



Small Jib Crane, built by Jones & Laughlin, Pittsburgh.—Fig. 1.—Elevation.

pound to the full amount at which it is rated. Six sizes are built, ranging in capacity from 2000 pounds to 3000 pounds. One peculiar advantage that this device possesses is that, when started by a sharp pull of the hand chain, it will run down easily and smoothly. Among other applications it is suitable for use in serving lathes, for changing rolls in trains, for handling piles at furnaces, for lifting and handling flasks in foundries in wings and corners not within the swing of the large cranes, and for general work that they are too cumbersome to handle. In constructing, these cranes may be bolted to woodwork as shown in the engraving. Another and very simple arrange-

4000 tons per week increased consumption during twenty-six weeks, which is remarkable. From the figures relating to the quantities received and delivered by Messrs. Connel & Co., we observe that the total stock at Christmas, 1880, was 495,850 tons; the stock received during 1881 amounted to 136,447 tons, and the stocks delivered were 5111 tons, leaving a total stock at Christmas, 1881, of 627,186 tons. As the stocks now existing in Scotland cause comment, it is prudent to consider them in their relation to the whole production of Great Britain, which, in 1881, was about 8,000,000 tons, and it is calculated that this immense output has all been absorbed, excepting some 250,000 tons. It will be peculiar, if with every iron center in full employment, Scotland should go on adding to the accumulation without getting a fair share of the general prosperity. The British colonies and Canada are in a state of exhaustion and will be compelled to take supplies from England, and the future of the trade, consequently, rests on a healthy foundation, both as regards the internal and external features, especially as pig iron is moderate in price compared with the improving values of all other descriptions of iron.

Exports from the United Kingdom to the United States for January.—Subjoined is a classified list of the exports of iron and metals from the United Kingdom to the United States of America during the month ended January, 1882, as compared with the corresponding month of 1881:

| | 1881. | 1882. |
|--|--------|--------|
| Pig, tons..... | 15,654 | 31,460 |
| Bar, angle, bolt and rod, tons..... | 1,845 | 4,520 |
| Railroad of all sorts, tons..... | 7,921 | 97,498 |
| Hoops, sheets and boiler plates, tons..... | 280 | 3,738 |
| Templates, tons..... | 29,177 | 29,850 |
| Cast and wrought, tons..... | 735 | 528 |
| Old, for remanufacture, tons..... | 5,324 | 0,285 |
| Steel, unwrought, tons..... | 3,675 | 45,439 |
| Lead-pig, rolled, sheet, tons..... | 30 | 265 |
| Tin, unwrought, cwt..... | 585 | 648 |
| Hardware and cutlery..... | 42,792 | 40,574 |
| Machinery of all sorts..... | 36,261 | 37,215 |

The Scotch Pig Iron Trade, 1881.

The annual circular of Messrs. J. E. Swan & Bros., Limited, of Glasgow and Middlesboro', Scotland, contains some interesting information concerning the Scotch pig iron trade during the year 1881. It is stated that the prevailing features at the close of 1880 were of a hopeful character, and for a short time after the resumption of business at the commencement of 1881, there was an inclination on the part of many to regard the probabilities of the future as encouraging. This led to a considerable amount of speculative activity, at advancing prices; but as it soon became apparent that crude iron was rising out of proportion to the values obtainable for finished descriptions, and that stocks of pig iron on this side of the Atlantic were sufficient to prevent exports on a large scale from this district, a pause soon followed, the market relapsing into a drooping condition, and remaining weak in tone, with nothing of sufficient importance to arrest the depression till about midsummer, when public attention was again awakened by the reports coming from almost every source, proving that the movement from a period of lethargy and contraction, to a state of vigorous expansion,

The length of the submarine tunnel between Italy and Sicily will be about 13,200 meters (43,295 feet). The minimum depth of the sea above the line of the tunnel is 110 meters (360 feet), and the thickness of rock between the roof of the tunnel and the bottom of the sea is 35 meters (114 feet). The direction of the tunnel from St. Agata to Punta del Pizzo is almost due northwest to southeast, the two inclines leading to the tunnel running parallel with the above for some distance and then descending to the lowest level by spiral tunnels. The length of each of these inclines is 14,640 feet, and the degree of inclination will be about 35 per 1000, this having been found by experience to be perfectly practical. According to the opinion of all geologists, the bottom of the Straits of Messina consists of crystalline rock (granite gneiss and mica schists). Neither in Calabria nor in Sicily can the upper strata that cover this crystalline rock be so thick as to reach the level of the bottom of the descending inclines. Geological and hydraulic considerations agree in the conclusion that the submarine isthmus between Punta del Pizzo and St. Agata cannot consist of material that is compact or easily corroded.

Fig. 2.—Enlarged Detail of Worm and Wheel.
ment is employed by the makers for attaching the device to roll-trains, lathe beds, and the like. This apparatus embraces the good points of differential blocks and at the same time is much more durable.

AUBURN FILE WORKS,

Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y.

Paris, 1876.


McCAFFREY & BRO.,

PENNSYLVANIA FILE WORKS,

Philadelphia, Pa., U. S.

For Superiority.



Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

GRAHAM & HAINES,

P. O. Box 1049.

113 Chambers and 95 Reade Streets, New York.

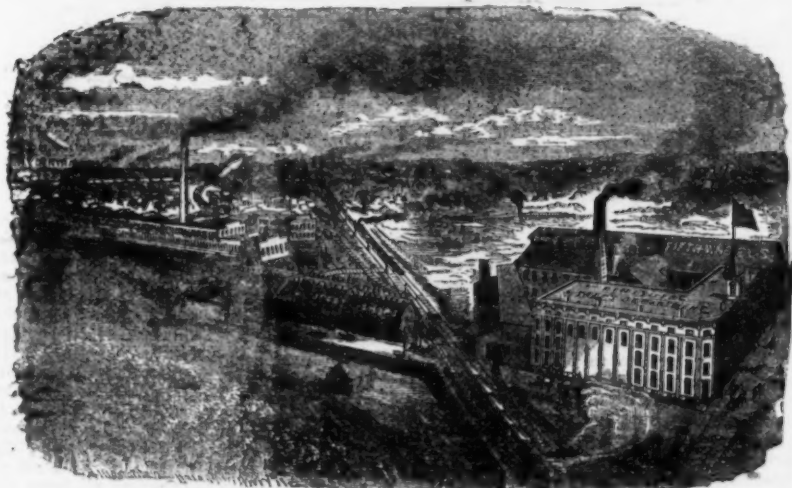
HARDWARE MANUFACTURERS' AGENTS, as follows:

Detroit Block Works,
Knickerbocker,
Knickerbocker & Co.,
Cotton, Wool and Curry Cards
Thompson, Derby & Co.,
Sawthe Mills,
Chicago Fork Mills,
Steel Forks, Rakes, Hoes, &c.
M. Knickerbocker,
Sawthe Mills, Axes and Tools.
E. W. Kipp, Nail Manufacturers.
Iron City Tool Works Ltd., Vices,
Picks, Mattocks, Grub Hoes, &c.
Jacobus & Nimitz Mfg. Co.,
Locks, &c.
Handusky Tool Co.,
Pliers and Plane Irons.
Geo. M. Eddy & Co.,
Measuring Tapes.

Wheeling Hinge Co.,
Hinges and Wrought Butts.
Northwestern Horse Nail Co.,
Horse Nails.
A. G. Case & Co.,
Cone's Genuine Screw Wrenches.
F. K. Kirby, Emery Cloth.
Sedgwick Mfg. Co.,
Butter and Flour Triers, etc.
Ripley Mfg. Co., Mouse Traps.
Saw's Loring,
Plymouth Tack & Rivet Works.
Carr, Crasley & Devlin,
Miscellaneous Hardware & Cast
Butts.
J. Mallinson,
Cast Steel Shears and Sissors.
Ketchum's Pat. Metallic Sieves.

W. D. Turner & Co.,
Geneva Hand Fluters.
American Screw Co.,
Gimlet Pointed Screws, &c.
Romer & Co., Brass Locks, &c.
F. Lowenthal, Compasses,
Callipers, Dividers, &c.
Clark Bros. & Co.,
Carriage Bolts, &c.
Lowers & Tucker, the Gen-
uine Knox Plating Machine.
Kentucky Nail Co.,
"Dodge's" Kentucky Cow Bells.
Lane Bros., Swift's and Gro-
cers' Coffee Mills and Measuring
Faucets, &c.
T. C. Richards Hardware Co.,
Bright Wire Goods, Picture Nails,
&c.

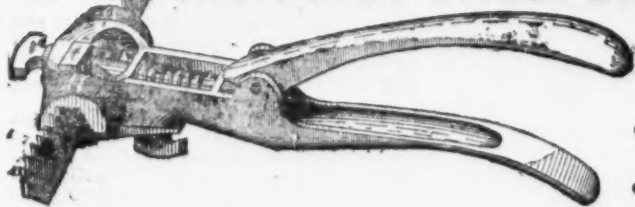
CARRIAGE HARDWARE.



Our new Illustrated Catalogue of 140 pages, and over 300 illustrations, will be mailed on application.

THE E. D. CLAPP MFG. CO., Auburn, N. Y.

Morrill's Perfect Saw Sets.



For price lists and

discounts, address

ASA FARR,

64 College Place,

corner of

Chambers Street,

New York.

SANDS' TRIPLE MOTION WHITE MOUNTAIN ICE CREAM FREEZERS.

THE WHITE MOUNTAIN FREEZER COMPANY are headquarters for Ice Cream Freezers and Ice
Crushers, being the only firm in the United States who manufacture all parts of the raw material. The
Sands' Triple Motion Freezer to all persons in the world for the following reasons: We have used them; they freeze
quicker than any other; they save time, salt and ice; the triple motion makes
smooth cream without lumps; makes more of it; galvanized iron outside; tin
inside; no zinc in contact with the cream; easily adjusted; substantially
made; simple in construction; perfect in results. Send for descriptive circular
and discount of this celebrated Freezer.

HAND FREEZER.
\$10 to \$15.HAND OR POWER.
\$15 to \$25.HAND OR POWER
ICE CRUSHER.
\$75 to \$100.White Mountain Freezer Co.,
Nashua, N. H., U. S. A.

SPECIAL ATTENTION GIVEN TO EXPORT ORDERS.

GEO. M. SCOTT, Bellows Manufacturer,

Johnson Street,

Cor. 23d St.,

CHICAGO, ILL.



TUFTING BUTTON

PATENTED June 28, 1881.

THE AMERICAN TACK CO., Fairhaven, Mass.,

Are making TUFTING BUTTONS with every Eye Soldered to its Back, giving them great Strength
and Durability. All Buttons are guaranteed satisfactory. Also Lining and Saddle Nails, and every
variety of

TACKS and NAILS.

New York Salesroom,

116 Chambers Street

Nicholson FILES.

Bandsaw Files,
Boot Heel,
Brass,
Cabinet,
Cant,
Cotter Taper,
Cotter Equaling,
Cross or Crossing,
Doctor,
Drill,
Feather Edge,
Finishing,
Flat,
Flat Equaling,
Flat Wood,
Gang-Edger,
Ginsaw,
Gulleting,
Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-End),
Handsaw Taper, single cut,
Handsaw Taper, double cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
Square Equaling File,
Stave Saw,
Three-Square Files,
Three-Square Blunt Files,
Tumbler Files,
Union Cut,
Warding Files,
Warding Blunt File,
Warding Round Edge File.

RASPS.

Baker's,
Beveled Edge,
Bread,
Cabinet,
File, Flat and Half Round,
Flat Shoe,
Flat Wood,
Half-Round Shoe,
Half-Round Wood,
Horse, Plain and Tanged,
Horse Mouth,
Jig,
Oval or French Shoe,
Racer, Plain and Tanged.

SPECIALTIES.

Butchers' Steels, Improved,
Bent Riffles, Handled,
File Cards,
File Brushes,
Machinists' Scrapers,
Stub Files & Holder, Detach-
able.
Surface File Holder,
Vise File Holder.

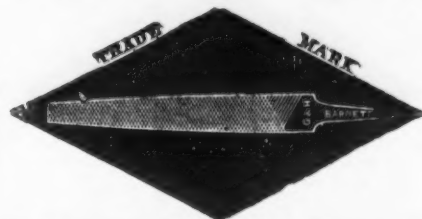
NICHOLSON FILE CO.,

PROVIDENCE,

R. I.,

SOLE MANUFACTURERS.

Black Diamond File Works.



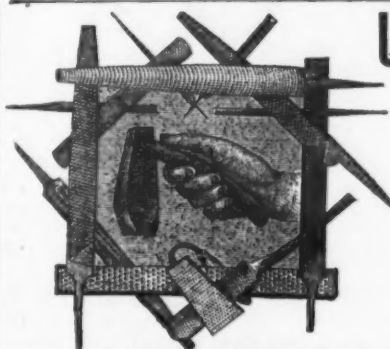
Awarded by Jurors of Centennial Exposition, 1876, for
"VERY SUPERIOR GOODS."

G. & H. BARNETT,

39, 41 & 43 Richmond St., Philadelphia.

CHARLES B. PAUL, Manufacturer of HAND CUT FILES.

Warranted CAST STEEL. 157 Tenth Street, Williamsburg, New York.
All descriptions of Files made to order. Price List mailed on application. Established 1863.



UNION FILE WORKS,

311 to 315 North St.,

BALTIMORE, MD.,

Manufacturers of

FILES AND RASPS

Made from the Best Refined Cast Steel.
With all the requisite facilities to produce a
first-class article, we are enabled to offer Files
that will give entire satisfaction.

MORITZ & KEIDEL, Agents,
48 & 50 German St., Baltimore, Md.

ESTABLISHED 1842.

INCORPORATED 1881.



CHAS. F. CRIPPS, President.

GILBERT PARKER Treas. and Gen. Agent.

THE J. BARTON SMITH CO.,

Manufacturers of the Celebrated

J. B. SMITH'S FILES, RASPS, WOOD SAWS, &c.,

211, 215 & 217 New Street, PHILADELPHIA.

WM. H. BRAMHALL, Manager.

New York Branch, 125 Chambers Street.

Prices the lowest. Goods the best.

Send for sample order.

DODGE & BLAKE.

DODGE'S PATENT

FILE FORGING AND FILE GRINDING.

These machines have long been in use in this country and in Europe, and are unexcelled for per-
fection of work and labor saving. We now offer them with the latest improvements, and will apply them
to forging and grinding other articles of tapering or otherwise irregular form.

Works at Woodside, NEWARK, N. J.

THRIFT FILE WORKS,

Manufacturers of all kinds of

Files, Rasps.



FILES

JOHNSON & BRO.

No. 1 Commercial Street, Newark, N. J.

FILES! FILES!

FILES

NORTHWESTERN FILE WORKS,

65, 67 and 69 So. Canal St., Chicago,

Make a specialty of 12 and 14-inch Flat. Will be

pleased to hear from parties using the above sizes

largely.

STOVE REPAIRS.

Repairs for Stoves made at Troy, Albany, Ro-

chester, Cleveland, Buffalo, Boston, St. Louis,

Quincy, Chicago, Milwaukee and elsewhere, at

W. C. NETZNER,

127 W. Randolph St., Chicago, Ill.

LANE'S MEASURING FAUCET.

Price, \$3.00.

For Light or Heavy Molasses, Oils,

Varnishes or other Fluids.

We warrant these Faucets to be as represented,
measuring correctly and working
more easily in heavy molasses than any meas-
uring faucet in the market. No grocer can
afford to be without them, for they save time,
and "time is money." They insure perfect
cleanliness, requiring no tin measures or fun-
nel to collect dirt and draw flies. They do not
drip. They prevent all waste, as no molasses
or other fluid can pass except when the crank
is turned. They are the embodiment of sim-
plicity, and consequently they are always in
order. They work easily in the heaviest mol-
asses. They are warranted to measure cor-
rectly, according to U. S. Standard.

MANUFACTURED EXCLUSIVELY BY

LANE BROS., Millbrook, N. Y.

General Agency, GRAHAM & HAINES, 113 Chambers St., New York.



J. M. KING & CO.

WATERFORD, N. Y.,

Manufacturers of the BUTTONS PATENT

"WIRE CUTTER AND PLIER COMBINED."

Specially Adapted for Use on Wire Fence.

Also Manufacturers of

Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps,

Hand, Nut and Screw Taps, Pipe Taps and Reamers.

Price List on application. Established by DANIEL B. KING, 1899.

A. FIELD & SONS,

TAUNTON, MASS.,

MANUFACTURERS OF

AMERICAN AND FRENCH WIRE NAILS, TACKS, SHOE NAILS, And Every Variety of Small Nails.

Offices & Factories at Taunton, Mass.

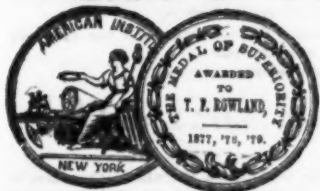
Warehouse at 78 Chambers St., New York,

where may be found a full assortment of Tacks, Brads, Wire Nails, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from sample to order.

A SILVER MEDAL has been awarded above goods at the Paris Exposition, being the only medal awarded any American manufacturer of Tacks and Wire Nails.

DUK'S PREMIUM ELEVATOR BUCKET.



ALWAYS FIRST
COMPETITIVE



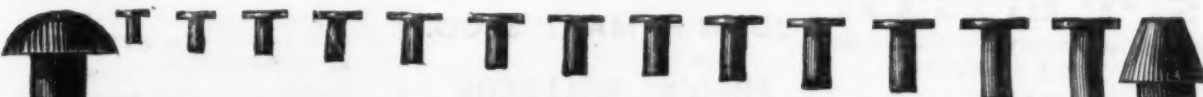
PREMIUM IN
TESTS.

This Bucket is struck out from the best charcoal iron; consequently is very durable. It requires 50 per cent. less power to run it than the old-fashioned square bucket, and will outwear half a dozen of them. Over 300,000 are now in use by the principal Millers, Brewers, Distillers and Manufacturers at home and abroad. It is the best Bucket made.

CAUTION.—The popularity of the DUK BUCKET has caused many manufacturers of the old style of Elevator Bucket to closely imitate its spherical shape. We warn all parties against patronizing infringers of our patents, as they will be held accountable. Send for circular. Address

T. F. ROWLAND, Sole Manufacturer, Continental Works, BROOKLYN, N. Y.

The Mill Bucket, in sizes from 3 1/4 to 16 inches.



OLD COLONY RIVET CO., Kingston, Mass.

(Established 1866.)

Manufacturers of NORWAY IRON RIVETS of Superior quality.

We carry a large stock of the various sizes of *Tinners', Carriage, Wagon, Hame, Belt, Barred, Safe and Tank Rivets*, and make promptly to order all sizes not larger than 7-16 inch diameter. We have a capacity of two tons of the various sizes of small Rivets per day of ten hours. Freight allowed to all points on or east of the Mississippi River. Correspondence with buyers solicited.

WILLIAM H. DUNBAR, President.

HENRY HOBART, Treasurer.

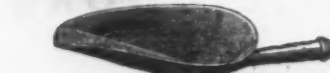
JAMES L. HALL, General Agent and Manager.

We carry the most complete stock in the city with our New York agents, *The American Tack Co.*, 116 Chambers St.



TWINE
BOXES,
BAG
FILLERS,
HAND
SCOOPS,
&c.

Send for Illustrated
Price List.



Manufactured by

John Chatillon & Sons,
89, 91, 93 Cliff Street, New York.

ESTERBROOK'S

STANDARD
and
RELIABLE

STEEL PENS
FOR SALE
BY ALL STATIONERS.

ESTERBROOK STEEL PEN CO.

Works, Camden, N. J. 20 John St., New York.

THE ANSONIA CORRUGATED STOVE PLATFORM.



With Patented O. G. Border.
ROUND ZINC.

27, 30, 32, 34, 36 inch.

Manufactured of heavy metal, requiring no nailing or lining, the edge retaining its form. Superior pattern, finish and quality. Price as low as any.

Send for List and Discount.
Packed 12 in each case.

PURE ELECTRIC WIRE,

Manufactured by the

ANSONIA BRASS AND COPPER COMPANY,

For Magnets, Telegraphs, Telephones, &c.

Insulated on the bare wire with H. Splidorf's patented Liquid Insulation, covered with cotton or silk.

All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Cash Bells, Bell Punches, Steamboat and Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

ESSEX HORSE NAILS.

Hot Forged, from Norway Iron, Warranted Best Quality, Pointed and Polished.

HOWE & CO., Troy, N. Y., Sole Agents.

The National Bankruptcy Bill.

The following is the full text of the Bankruptcy Bill agreed upon by the Senate Judiciary Committee, and which has been reported to the Senate:

A bill to establish a uniform system of bankruptcy throughout the United States. Be it enacted, &c., that whenever any person, without fraud, shall have become involved in debts and liabilities beyond his means of payment, and amounting to \$500 or upward, he may apply by petition in equity, setting forth his insolvency and the cause thereof, with schedules of his liabilities and assets, duly verified, to the District Court of the United States for the district in which he may reside, on which jurisdiction is hereby conferred, to surrender his estate for the benefit of his creditors, except so much as shall be exempt from execution under and by the laws of the State where he resides; and thereupon, if good cause appear, the court shall adjudge the petitioner to be a bankrupt, appoint a receiver of such estate, and cause reasonable notice by service, mail, publication or otherwise, to be given to all persons interested, and shall proceed to hear and dispose of the cause upon its merits as the pleadings and proofs may require, and to marshal and distribute said estate among the creditors of the petitioner according to the rules and practice of equity. And if it shall appear that such debts and liabilities were incurred without fraud, and that the inability of the debtor to make payment has arisen from accident and misfortune and without fraud, the court shall grant him a discharge as a bankrupt from all such debts and liabilities. This act shall also apply to corporations.

Sec. 2.—That whenever any person residing and owing debts as aforesaid, after the passage of this act departs from the State, District or Territory of which he is an inhabitant, with an intent to defraud his creditors, or, being absent, remains so with like intent, or conceals himself to avoid arrest or the service of legal process issued or feared, or makes a fraudulent transfer of his property, or conceals or removes the same to avoid process, or with intent to defraud his creditors, procures or suffers judgment against him, or gives a warrant to confess judgment or judgment note with like intent, or who, having been arrested in any civil action fails or neglects to give bail, or in some other mode to procure his discharge for twenty days, or fails to dissolve an attachment laid upon his property in a civil action for a like period, or fails for sixty days to satisfy a final judgment or decree rendered against him for the payment of money unless a supersedeas or stay of execution has been effected in respect thereto, or who, being a trader, has suspended and not resumed payment of his commercial paper, open accounts made, passed or contracted in the course of his business for a period of thirty days after the same were payable, or who, being insolvent, makes a preference to any creditor, or makes an assignment for the benefit of existing creditors, with or without preference, any creditor or creditors may file such a petition in behalf of all persons interested, and thereupon the like proceedings shall be had as in the case of a petition by the debtor. Insolvency in this act shall be deemed to exist only when the debtor's liabilities exceed in amount the value of his property liable to execution, and the available debts due him.

Sec. 3.—That the Court shall have power to grant extensions of time for payment, and to reduce the amount of indebtedness *pro rata* for the purpose of allowing the debtor to proceed with his business if it shall seem best so to do. And any agreement between the debtor and a majority in amount and number of his creditors may be carried into effect if approved by the Court.

Sec. 4.—That the Court may at any time during the proceedings order that all or any other proceedings be stayed or dismissed, and may require all or any claims to be presented to it for determination, or may allow any other proceeding to be prosecuted to final judgment and such judgment to be filed in the bankruptcy. Any claim not due may be matured by a rebate under an order of the Court. No creditor shall be prejudiced by having taken security in good faith and without notice of impending bankruptcy, but securities otherwise taken may be set aside.

Sec. 5.—That any interlocutory matter in the course of the proceedings may be heard before any standing or special Master in Chancery and under a standing or a special order of reference, and at any place designated in such order; but all the decisions of such masters shall be subject to the summary and informal supervision and control of the Court. The Circuit Judge and the Associate Justice of the Supreme Court assigned to the circuit shall have and exercise a like supervision and control over all the proceedings of the District Court in Bankruptcy; and at the request of any person aggrieved by any decision of the District Court or the Judge thereof, he shall forthwith certify the questions involved in such decision to the Circuit Judge for summary review and redetermination; and any decision of the Circuit Judge may be in like manner reviewed by said Justice of the Supreme Court, and the party aggrieved may seek relief by appeal as in other cases.

Sec. 6.—That any conveyance, transfer or payment made and received in view of bankruptcy may be set aside if found to be contrary to the just rights of other creditors; but money obtained and used in good faith, though unsuccessfully, to avert an impending bankruptcy, or to save a threatened sacrifice of property, or for sickness or other like necessity, may be preferred in payment or in security by the Court.

Sec. 7.—That if it shall appear that any creditor has willfully and oppressively sought to bring about the bankruptcy of the debtor, or to obtain any fraudulent advantage over other creditors, the Court may deny such wrongdoer any participation in the estate, or only a partial benefit of his claim, as may seem just. The discharge of the bankrupt shall not operate against any liability for fraud, trespass or other wilful tort; but the validity of any discharge in bankruptcy shall not be contested after the expiration of two years from its date.

Sec. 8.—That the district courts shall be considered as always open for the reception

and consideration of the business under this act, and at their regular terms the bankruptcy business shall have precedence over all other kinds.

Sec. 9.—That it shall be the duty of the Supreme Court to make such additional rules in equity, if any, as may be required to carry this rule into full effect, and to fix all fees and costs for services in bankruptcy under this act.

American Steel for American Ships.

One of the most important bills other than tariff acts introduced into the present Congress—important in the sense of its beneficial influence on the iron and steel trades—is the bill of the Naval Committee for the construction of a number of naval vessels. The points of the bill of most interest to these industries are as follows:

"Section 1.—That the Secretary of the Navy is hereby authorized and directed to cause to be constructed six cruising vessels of war, the same to be constructed of open-hearth steel of domestic manufacture having a tensile strength of not less than 55,000 pounds to the square inch, and a ductility in 8 inches of not less than 25 per centum; said vessels to be provided with sail power and full steam power. * * * And the Secretary of the Navy is hereby further authorized and directed to cause to be constructed one steam ram having a displacement of not more than 2000 tons, to have an average speed at sea of not less than 13 knots per hour, and to be constructed of steel of the quality and kind above named, and four steam cruising torpedo boats, not exceeding in length 125 feet each and having a maximum speed of not less than 21 knots per hour, and four steam harbor torpedo boats, not exceeding in length 100 feet each and having a maximum speed of not less than 17 knots per hour, all of said torpedo boats to be constructed of steel of the quality and kind hereinbefore designated. And there is hereby appropriated out of any money in the Treasury not otherwise appropriated, the sum of \$10,000,000, to be expended under the direction of said Secretary of the Navy for the construction of said six cruising vessels of war, the engines, boilers and armaments, the said steam ram, its engines and boilers, and the said torpedo boats, which sum, or so much thereof as may be necessary, shall be immediately available on the passage of this act."

This decision in favor of steel has only been arrived at after a most thorough investigation, and in spite of the most strenuous opposition on the part of certain naval officers. Some of the statements of these officers were most absurd and untruthful. The minority of the Advisory Board of the Navy Department make the following ridiculous statement regarding steel:

"6. We dissent from the opinion of the majority that the material for the hulls of the vessels proposed, except those of the ten-knot gunboats, should be of steel. We recommend iron instead of steel, and we do this after a careful comparison of the merits of the two. The term 'steel,' as applied to the material used under that name for shipbuilding, is a misnomer, as it has none of the physical qualities of steel; it will not temper, is deficient in elasticity, and is simply a high quality of iron, made at greatly increased cost from cast ingots, instead of by the puddling process. It originated in Great Britain, owing to the low quality of shipbuilding iron manufactured there, which has about one-fourth less tensile strength than the iron manufactured in the United States. Owing to the great difference in the quality of the British and United States iron, the comparison between the respective merits of British iron and this so-called steel has no application to United States iron. In recognition that the shipbuilding material called steel is not properly so named, the term 'mild steel' has been applied to it, merely for the sake of distinction."

This is a "Daniel come to judgment," certainly, and may be regarded as settling, without further dispute, the question as to the application of the word "steel" to open-hearth, mild, or any other mild steel. The minority continue:

"We assume that the great national vessels proposed are to be constructed of materials manufactured in the United States, and not imported from Great Britain. Before these vessels could be constructed of this mild steel, the manufacture of that material would have to be created in this country; enormous plant at correspondingly great cost, requiring much time to make and put in successful operation, would have to be obtained, and workmen would have to be educated to its use; also, as there is now no demand for this kind of steel for shipbuilding in the United States, the cost of educating the workmen and creating the plant to produce it would have to be entirely borne by the few naval vessels that might be constructed of it. Should mild steel be insisted on for the hulls of these vessels, the contracts for it would probably fall into the hands of a few middlemen or speculators, who, instead of having it manufactured here, would import it, while receiving for it an excessive price, based on what would be the great cost of its manufacture here. Under these circumstances no reasonable approximation can be made of the increased cost of our vessels if built of mild steel instead of iron, but evidently the increase would be very great."

It certainly will be news to our American steel manufacturers that steel suitable for ship plates, which was first made in this country, cannot be made here, and that we have neither the plant nor the skill necessary to the production of this material in quantities for these vessels. Mr. James Park, Jr., of Pittsburgh, is probably as well posted in steel as any man in this country. He states in evidence as follows before the committee:

Mr. Morse: "How many makers of steel are there in this country whose steel you would buy for the purpose of building plates for ships?"

Mr. Park: "I do not know any of the makers in this country, whose names I have given to the committee, in whom I have not as much confidence as I have in our own firm. They are all making steel as nearly alike as possible."

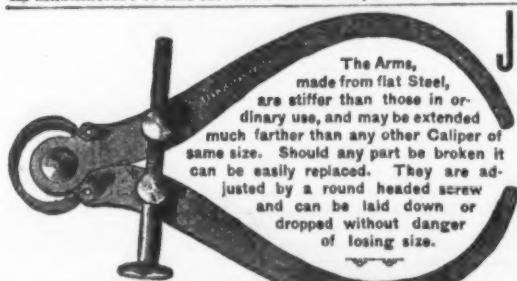
The Chairman: "Give us the capacity of the steel-rolling mills in this country."

Cutlery.

THE
LAMSON & GOODNOW MFG. CO.,Salesroom and Warehouse,
39 Chambers Street, New York City.Factories,
Shelburne Falls, Mass.Superior Cutlery of all kinds and grades, from the finest in pearl and ivory handles to the lowest
size in wood and iron handles.OUR
BUTCHERS' and HUNTERS' KNIVES

Are warranted to be equal in style, finish and quality, to any goods made in the world.

"COMPARE, THEN JUDGE."

We are the sole owners of the *Gardner Patent Guard and Rest for Carving Forks*, and
the manufacture of fine carvers with us a specialty.

8 inch,.....\$11.50. 5 inch,.....\$15.00. 7 inch,.....\$20.00 Per Dozen.
DISCOUNT TO THE TRADE.

J. R. Torrey Razor Co

WORCESTER, MASS.

MANUFACTURERS OF
AMERICAN RAZORS
Sole Agents for
**WRIGHT'S PATENT
CALIPER.**

JOHN WILSON'S CELEBRATED

TRADE MARK.



GRANTED A D 1766 BY THE
CORPORATION OF CUTLERS OF SHEFFIELD
AND PROTECTED BY ACT OF PARLIAMENT.

REGISTERED ALSO AT
WASHINGTON U.S.A. ACCORDING TO ACT OF
CONGRESS.

ALSO AT LEIPZIG, IN
ACCORDANCE WITH THE GERMAN TRADE
MARKS' REGISTRATION ACT.

WORKS: SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750

Seymour's Diamond Edge Solid Cast Steel
SHEEP SHEARS.

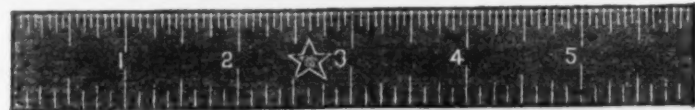
Great Triumph of American Industry.



See issue
of March 2
for full
particulars.

Every Pair Warranted Superior to Imported. Price lists sent on application.
HENRY SEYMOUR CUTLERY CO., 84 & 86 Chambers Street,
NEW YORK.

Manufactured of
IMPORTED ENGLISH CAST STEEL.
Every Pair Warranted.
For samples and prices address,
GIFFORD MANUFACTURING CO.,
OFFICE, 39 NORTH STREET, NEW YORK.
Factories, Union City, Ct.



STAR TOOL CO.

FLEXIBLE STEEL RULES and CENTER GAUGES Made of Best Quality Tempered Steel.
These Rules and Gauges are guaranteed of correct measurement, graduating 1/16, 1/8, 1/4 and 1/2
inch. Price lists upon application.

McCOY & SANDERS, Sole Agents,
43 Chambers St., New York.

Office of

PHOENIX CASTER CO.

Indianapolis, Ind.



Hibbard, Spencer & Co., Chicago, have
sold our Casters as follows:
1879.....\$322.60
1880.....590.92
1881.....1371.26
Melson, Matter & Co., Grand Rapids,
Mich.:
1879.....\$64.60
1880.....240.00
1881.....574.51

PHOENIX CASTER CO.

Manufacturers,
INDIANAPOLIS, IND.

Our Pump is so uniform, simple,
strong and efficient,
it has won
prizes at all
competitions from the
World.



TUCKER & DORSEY,
MANUFACTURERS,
INDIANAPOLIS, IND.

Cutlery.

CORPORATE MARK.



Joseph Rodgers & Sons'

(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons'
productions having considerably increased, they
have, in order to meet it, greatly extended their
Manufacturing Premises and Steam power.

To distinguish Articles of Joseph Rodgers
& Sons' Manufacture, please to see that they bear
their Corporate Mark

P.O. Box 3062.

ESTABLISHED 1836.

Alfred Field & Co.,
COMMISSION MERCHANTS,
New York, Birmingham, Sheffield, Liverpool.

Guns and Pocket Cutlery,
SPECIALTIES.

Headquarters for

ELEV'S PROOF GOODS, WRIGHT'S ANVILS,
WILSON'S BUTCHER KNIVES, &c.
WOSTENHOLME'S POKET CUTLERY AND RAZORS.
FIELD, FRASER & CONTINENTAL POKET KNIVES.
BUTCHER'S FILES, TOOLS AND RAZORS.
JOSEPH ELLIOTT'S CELEBRATED RAZORS.
WESTERN WILK CO.'S FILES.
ENGLISH AND GERMAN GUNS.
ROBERT SORBY & SONS' SHEEP SHEARS.
STUBB'S FILES, WESTERN FILES.
GREAVES' SHEEP SHEARS.
CHESTERMAN'S TAPES.
GERMAN ROLL AND ROLLERS and other CHAINS.
BRADY'S TROWELS AND HOES.
CANASTOTA KNIFE CO.'S POKET KNIVES.
Etc. Etc. Etc.

All sorts of Hardware and Merchandise for Import
and export purchased on commission.

Silver Medal, 1878-Paris.



JOHN SPENCER & SON,

Albion Steel Works, Sheffield,

MANUFACTURERS OF

FILES

AND

STEEL,

Table Knives, Razors, Shovels, &c., &c.,
of every description.

CORPORATE MARK.

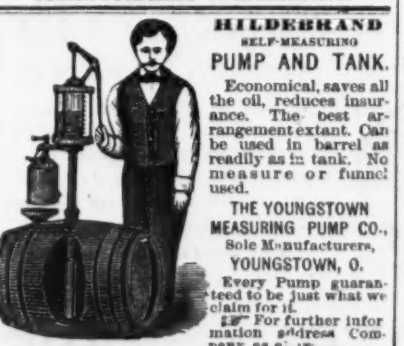
**SPENCER
SHEFFIELD**
Granted 1749.

FURNESS, BANNISTER & CO.,
NEWARK, N. J.

Manufacturers of

TABLE CUTLERY.

PRICES FURNISHED ON APPLICATION.



GEORGE W. BRUCE,

1 Platt St., New York, Proprietor of the

Atlantic Screw

Works,

And Agent for the

Florence Tack Co. and

O. A. Maynard

Maynard's C. S. Planters'

Hilling and Bog Hoes;

Hilling; Kewell's Weeding

Planters' and Grub, and a

variety of other kinds for

Home and Export Trade.

THE "EDDY" STRAIGHTWAY

VALVES.

ALSO,

FIRE HYDRANTS.

Axe, Hatchet, Powder and

Brush Machinery.

MOHAWK & HUDSON MFG. CO.,

WATERFORD, N. Y.

BENTON, FAULKNER & BIRD, N. Y. Agents.

C. H. & W. H. MIDDLETON Phila. Agents.

Fires from Spontaneous Combustion

May be prevented by using

MACHINERY WIPER CLOTHS,

Instead of cotton waste for cleaning Machinery, &c.

Don't wait until you have a fire before waking up to

the importance of adopting our Wiper-Cloths. For

sale by the trade generally, or by the

BROWN MANUFACTURING CO., Providence, R. I.

These Towels are the best for all kinds of cleaning.

Price to consumers, \$3 per 100. Special prices to the

Cutlery.

ROBERT SORBY & SONS,

SHEFFIELD,

MANUFACTURERS OF THE CELEBRATED

Kangaroo Sheep Shears.

The best
Shears
made.

CORPORATE MARK

Every
Shears
Guaranteed.

ALFRED FIELD & CO.,

93 Chambers St., - NEW YORK,

SOLE AGENTS.

Send for price list and terms.

ESTABLISHED 1853.

E. E. EATON,

GUNS,

AMMUNITION,

Fishing Tackle,

CUTLERY,

53 State St. Chicago.

MANN'S

Trolling Spoons



Sixty varieties manufactured, suitable for Trolling
for all kinds of fish that will take an artificial
bait, and adapted for any lake or river in the
United States.

Our Perfect Revolving Spoon is undoubtedly the
best general Spoon for taking fish ever offered to
the public.

Three sizes made—No. 20 for bass, pike, pickerel,
or any fish under five pounds weight; No. 21 for
large fish, and the best spoon ever made for
salmon trout; No. 22 excellent for deep water fishing.

Beware of imitations. None genuine except JOHN

H. MANN'S name stamped on every spoon.

Sold wholesale and retail by the principal dealers

in Fishing Tackle.

JOHN H. MANN & CO.,

SYRACUSE, N. Y.

FRED'K MALLESON,

MANUFACTURER OF

Fishing Reels,

Split Bamboo Rods,

FINE WOOD RODS, HOOKS

ON GUT, LANDING RINGS

And FRAMES, &c.

136, 138, 140, 142 & 144 FIRST STREET,

BROOKLYN, E. D., N. Y.

KEYSTONE RIVETING FORGE.



An Improved Pattern.

Cheap and Durable.

BEST IN THE MARKET.

Send for catalogue to

KEYSTONE PORTABLE FORGE CO.,

204 North 4th St., Philadelphia, Pa.

SILVER & DEMING

MFG CO.,

MANUFACTURERS OF

Cistern, Pitcher, Well

and Force Pumps,

Wind Mill Pumps,

HAND AND POWER

ROTARY PUMPS,

Hydraulic Rams,

BOILER FEED PUMPS,

Garden Engines, &c.

Also, Carriage Makers' Tools,

Blacksmiths' Drills, Butchers'

Tools, and Feed Cutters.

Write for Catalogue and Prices.

SILVER & DEMING MFG. CO.,

SALEM, OHIO, U. S. A.

Established in 1839.

A. G. COES & CO.

WORCESTER,

MASS.,

Successors to

L. & A. G. Coes,

Manufacturers of

THE GENUINE

COES

Screw

Wrenches.

PATENTED,

May 9, 1871.

December 26, 1871.

December 28, 1875.

August 1, 1876.

The backstrain when the wrench is used is borne
by the bar—not by the handle.
The strongest Wrench made, and the only suc-
cessful Re-enforced Bar.
None genuine unless stamped

A. G. COES & CO.,

Our Agents, GRAHAM & HAINES, 113 Chambers St.,
New York, carry a full line of our goods, and will be
pleased to serve you at factory prices.

STANDARD
GIRARD WRENCH.
WARRANTED.

FOR
STRENGTH
AND
Durability
IT HAS
NO SUPERIOR.
—
GUARANTEED
IN
EVERY RESPECT.
—
Wrought Bar, Head
and Screw.

Owing to the in-
creased demand
for these justly
Popular Wrenches,
we are now manu-
facturing more than
any other establish-
ment in the world.

Our Wrench hav-
ing been imitated by
other manufactur-
ers, we have adopt-
ed the above Trade
Mark, and will here-
after stamp all our
goods.

SEND FOR

TERMS AND PRICES.

GIRARD WRENCH MFG. CO., Girard, Pa.

LAMBERSON'S
PRICE BOOKS.

Full Leather, \$7.50. Half Leather, \$6.50.

Pocket Edition, Full Leather, \$3.50.

DISCOUNT Bolt List, \$1.00.

Screw List, 50 cents.

Revised April 27, 1881.

Leigh's Discount Book, \$7.00.

Address all orders to *Pope & Stevens*, General

Agents, 114 Chambers Street, N. Y.

For sale at publisher's price by Wm. Blair & Co.,

Chicago; A. F. Shapleigh and Cantrell Hardware Co.,

St. Louis; C. B. James, Detroit.

GEO. H. CREED,

SHIP CHANDLERY.

103 Reade Street, New York.

Manufacturers of and Wholesale Dealers in

Cotton and "Long Flax" Sail Duck,

Cotton and Linen Havens,

Creed's Patent Ship's Clews, Helman's Wire Rope

Splicers, Agent for Raymond's American Crane Oil

for lubricating Cylinders and Valves.

CHAS. E. LITTLE,

59 Fulton St., N. Y.

928 Fulton St., Brooklyn, N. Y.

Solid Cast-Steel Pump Augers

For Boring Pump Logs and Pump

Tubing, with all necessary fittings. Agency for

Bernes' Wood-Working Machinery

and Lathes.

HALL & ELTON'S GERMAN SILVER.

1837.



1882.

In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

HALL, ELTON & CO., Wallingford, Conn., and 75 Chambers St., New York.

HOLMES, BOOTH & HAYDENS,

MANUFACTURERS OF

Finest Quality Silver-Plated Spoons, Forks, Knives, &c.



NOTICE.—We guarantee the base of our Spoons, Forks, &c., to be full 18 per cent. Nickel Silver, and extra heavily plated with pure Silver. Our goods are all hand burnished, and are first-class in every respect. We pack our Spoons and Forks one dozen in each box.

49 CHAMBERS ST., NEW YORK. } Factories, } 18 FEDERAL ST., BOSTON.
WATERBURY, CONN. }

T. G. CONWAY, 88 Chambers Street, New York,

Manufacturers' Agent for

REVOLVERS, BREECH-LOADING GUNS, TABLE CUTLERY,
CAST IRON, NICKEL PLATED & STEEL SHEARS.

Representing THE LEE ARMS CO.,
C. S. SHATTUCK.

THE GREENFIELD CO-OP. WORKS,
ATLAS WORKS.

J. K. RUPERTUS,
THE MILLVILLE SHEAR CO.

Escutcheon Pins, Small Rivets and Screws,

And Specialties in this line made to order by
BLAKE & JOHNSON,
WATERBURY, CONN.

PHOSPHOR-BRONZE! PHOSPHOR-TIN!

Phosphor-Bronze is daily gaining favor with manufacturers who have to use a metal of great toughness and durability, of fine grain, high tensile strength and ductility, and is acknowledged far superior to any other alloy on account of the readiness with which it takes a polish, its elasticity, fluidity and beauty of color. Its high price, however, has so far prevented the use of it to so large an extent as its merit would warrant. For the first time an article is offered herewith which makes it easy for everybody to manufacture his own Phosphor-Bronze of the grade it is wanted, by the simple process of melting. This article is PHOSPHOR-TIN. By melting a very small quantity of it with copper an excellent Phosphor-Bronze is obtained at a much cheaper price than the ready made Phosphor-Bronze can be had in the market. A trial ought to be made by everybody who is using it.

A. KAUFMANN, 36 Park Place, New York,
Sole Agent for the United States and Canada.
For pamphlets please address the above, P. O. Box 2116, New York.

SPECIAL TOOLS AND MACHINERY,
Gear Cutting Attachments for Lathes.
IMPROVED WORK HOLDERS, ARBORS, DRILL
PRESSES, EMERY GRINDERS, &c.

JACKSON & TYLER,
PROGRESS MACHINE WORKS, BALTIMORE, MD.
Also manufacturers of Set and Cap Screws.
Send for Price Lists.

TINIUS OLSEN & CO.,
STANDARD SCALES

TESTING MACHINES.

Manufacturers of Olsen's Little Giant Testing Machine, and Improved Railroad, Wagon and Furnace Charging Scales.
Office and Works, N. Y. cor. 12th and
Buttwood Sts., Philadelphia.

Mellert Foundry & Machine Co.,
Limited,
(Works Established at Reading, Pa., in 1841.)
Manufacturers of

Specials, Flange Pipe, Retorts, Valves and Hydrants,
Lump Pumps, &c. The Improved Canadian Turbine Water Wheel, Machinery and Castings for Furnaces, Rolling Mills, Grist and Saw Mills, Mining Pumps, Hoists, &c. Columns, Brackets, Iron Railings, &c.

Offices:
Second and Chestnut Sts., Reading, Pa., and
74 Pine Street, New York City.

RICHARD DUDGEON,

No. 24 Columbia Street, New York.

Maker and Patentee of the improved
Hydraulic Jacks
AND
Punches.



Roller Tube Expanders and Direct Acting Steam Hammers.
Communications by letter will receive prompt attention.
Jacks for pressing on Car Wheels or Crank Pins made to order



Our specialty Also, Crestings, Finials and Vanes, Stable Fixtures, Hitching Posts, Door and Window Guards Wrought-Iron Gratings, Fire Escapes and Ladders, Jails, &c. Our Fencing can be shipped to any part of the United States, and can be set up by the purchaser at small expense. Our prices are reasonable. Correspondence and notice of public lotteries of ironwork solicited. Every Hardware Dealer should have our Catalogue. Address
CLEVELAND WROUGHT IRON FENCE WORKS,
Office, 31 Water Street, near Union Depot, CLEVELAND, OHIO.

PURE CEYLON PLUMBAGO

In Bulk for Polishing
Stoves, &c.

The attention of stove dealers and jobbers and stove polish manufacturers is called to our Pure Ceylon Plumbago, made expressly for this trade. Packed in 25 and 50 lb. boxes for the retail trade, and in barrels for the wholesale and jobbing trade. Sold under our own name, or labeled to order, if desired. We guarantee the purity of this article, and will take back and refund the money for any lot that does not give satisfaction. Prices and samples furnished on application.



CRUCIBLES

FOR
German Silver, Brass and Steel.
Black Lead Stoppers and Nozzles.
Jewelers' Crucibles,
Covers, Dips, &c.
FILE HARDENERS.
All our goods are made of the finest Ceylon Plumbago.

W. T. MACFARLANE,
Treasurer and Agent.

WILCOX & HOWE, Birmingham, Et., Carriage Hardware.

(See Iron Age first issue of each month.)

Mr. Park: "In Cleveland, Ohio, Otis & Co. have two large plate mills. I suppose that they could produce, if pushed, some 60 tons a day. Singer, Nimick & Co., of Pittsburgh, can produce about 20 tons a day. Hussey, Howe & Co., of Pittsburgh, can produce about 20 tons a day. Park, Brother & Co., of Pittsburgh (our firm), can produce a like amount. The Bay State Mills, of Boston (a very large concern for rolling steel plates), can produce about 20 tons a day."

He could have added Shoenberger & Co., Spang Iron and Steel Company, the Siemens-Anderson plant, and a number of others that have open-hearth plants. In regard to the quality of our steel, Mr. Park said:

The Chairman: "Can we make as good steel for ship purposes as the English can?"
"Fully as good, and I should say better. We can make steel suited either to vessels or to boilers."

The Chairman: "Was your firm the first to produce steel in this country?"

Mr. Park: "No, sir; Hussey, Wells & Co., of Pittsburgh, produced the first good, acceptable homogeneous cast steel made in this country."

In regard to getting the steel in this country, Mr. Rowland, of the Continental Works, Brooklyn, testified:

The Chairman: "In your judgment, is there any difficulty in getting, in this country, all the steel, in plates, shapes, beams, &c., that would be required for the building of ships by the navy?"

Mr. Rowland: "No, sir."

The Chairman: "Without importing any?"

Mr. Rowland: "We would not have to import a bar."

This was nearly the universal sentiment of American steel manufacturers and builders who were examined before the Naval Committee. The quality of American steel for shipbuilding, and the ability of our manufacturers to answer all demands upon them for materials was thoroughly established, so thoroughly that, as will be seen, the committee in its bill provides that the steel shall be of domestic manufacture.

INDUSTRIAL ITEMS.

MAINE.

The Portland Machine Company are turning out a large number of locomotive engines. The company have two eight-wheeled locomotives of 36 tons each, ready for delivery to the Aroostook River Railroad. Among other work 20 dump cars for coal are building for the Portland and Ogdensburg Road, also five 25-ton dump cars of a new and peculiar construction for the same purpose for the Maine Central Road. This week the company commenced to deliver locomotives on a large contract with the Northern Pacific Road. They will furnish the road in all 34 of their regular eight-wheel 36-ton engines.

NEW HAMPSHIRE.

The Concord Machine Works during February shipped 14 machines to one party in Minneapolis, Minn., besides several in other directions.

The forge shop of the Cole Manufacturing Company in Lake Village is in operation day and night, turning out car axles, requiring two gangs of workmen.

The Franklin Needle Company manufactured 175,000 needles during the past month, and have orders for 200,000.

MASSACHUSETTS.

It is reported that the old nail factory, connected with the Robinson Iron Company Works, at Plymouth, will be torn down in the spring and a new one erected on the site.

Seven thousand kegs of nails have been shipped from the Somerset factories during the past week.

The capital stock of the Plymouth Foundry has been increased.

The Walpole Emery Mills, Boston, inform us that they sold during the year 1881, in round numbers, 1300 tons of manufactured emery. This is something over one-third of the entire sales of manufactured emery in this country during the year. This company have always claimed to manufacture a strictly superior article of emery, and sales like these would seem to verify their claims in a way which cannot be controverted.

CONNECTICUT.

The Corbin Cabinet Lock Company is to be organized at New Britain, with a capital of \$2,000,000. This company will purchase the cabinet lock business from P. & F. Corbin, and immediately erect a large factory. This new enterprise will add impetus to the general prosperity of this town and largely increase its population.

The Higginum Manufacturing Company have orders for plows from Southern Africa and for 200 horse rakes from Russia, and are now shipping dump-carts to a Mexican railroad company.

A new steel spring horseshoe company, at Shelton, have a capital of \$250,000, and will soon build a factory.

NEW YORK.

The No. 1 furnace of the Albany City Iron Works was lighted on the 18th ult., after lying idle for the past half year. The capacity of the furnace is forty gross tons per day Bessemer pig iron.

PENNSYLVANIA.

Tinius Olsen & Co., Twelfth and Buttonwood streets, Philadelphia, are kept very busy on their new improved testing machinery, which appears to be gaining favor. At the Atlanta Exhibition they were awarded the gold medal. Of orders lately received, one is for a 200,000-pound machine for Brown, Bonnell & Co., Youngstown, Ohio; also machines for the Rensselaer Polytechnic Institute, Swathmore College, Atlanta Bridge Co., A. B. Davis Spring Co., National Car Spring Co., Chicago, Burlington and Quincy Railroad Co., Oliver Wire Co., of Pittsburgh, as well as for several of the smaller cement testing machines.

Hillebrand & Wolf, at the Star Lock Works, Philadelphia, have recently enlarged their foundry for brasswork on an entirely new model. They have also secured the right for nickel-plating under the Potts patent, and are building an extension to accommodate this branch of their business. The

works were established in 1836, and have shown steady growth from the first, although 1881 has been by far the year of their greatest development.

The Rosena Furnace, at New Castle, has blown in and is making good iron.

The Charlotte Furnace, at Scottdale, is making about 420 tons No. 1 iron per week.

It is said that a glass factory is about to be erected at Blairsville, Indiana County, and that \$30,000 have been subscribed for that purpose.

The Isabella Furnace, West Nantmeal Township, Chester County, which chilled several times recently, has once more been cleaned out, and, it is expected, will be ready to go into operation again this week.

It is expected that the glass works which are being built in Meadville by parties from Kent, Ohio, will be ready to start by the middle of April. The concern will manufacture window and green glass.

A number of collieries around about Pottsville have been drowned out by the rain, among them eleven of the P. & R. Co.

A deed is now entered for record at Uniontown, wherein the consideration is placed at the moderate sum of \$1,778,425.66. The grantors are H. C. Frick, E. M. Ferguson and Walter Ferguson, and the grantee, the H. C. Frick Coke Company. The property comprises all the Frick Coke Works, from the Valley mines to the Youghiogheny River. This is probably the conclusion of the first Carnegie purchase.

The one-half interest in the brass and iron foundry of William S. Ellis, Pottstown, has been purchased by Burgess George B. Lessig, and the firm name hereafter will be Ellis & Lessig. The buildings now used as a machine shop, pattern shop and blacksmith shop will be converted into one large machine shop. New and improved machinery will be used. A new building, 60 x 100 feet, will be erected for molding purposes. This industry will be carried on more extensively now than ever, and a larger number of men will be employed.

It is probable that a rolling mill will soon be built at Washington, Washington County, by Pittsburgh parties, with Washington capital. The citizens of the town are reported very enthusiastic over the project.

Work on the new buildings of the Penn Reading Hardware Company is now being pushed forward, and considerable of the capenter work, such as door and window frames, is already on the ground. The foundation walls are just being finished. The building will all be admirably arranged and will cover several acres of ground. They will be of brick.

PITTSBURGH AND VICINITY.

It is expected that the rolling mill of the Vulcan Forge and Iron Co., at Chartiers, will be finished in May. The buildings are being built of part of the Main Centennial Building.

Col. J. M. Schoonmaker, of this city, has just purchased a body of 420 acres of coal land in the Connellsville region, paying \$325 per acre. This was about the only large body of good coking-coal land left in the market.

The electric light is to be placed in Dilworth, Porter & Co.'s mills, Bingham street, South Side. The mill will shut down for repairs in about two weeks.

The Chartiers Glass Co. have shut down for the purpose of making repairs. They will be again in operation about March 13. Trade has been very fair with them all winter, but is now quiet. They lately increased their capital stock \$10,000.

Workmen are busy excavating for the foundations of George A. Macbeth & Co.'s new glass furnace. This is not to supersede the furnace now in operation, but is to be used in addition to it. They will push their new one to completion as fast as possible, as their business needs it. Trade is very good with this house.

At the works of the Pittsburgh Steel Casting Co., on the 2d inst., a piece of work was performed which will attract no slight degree of attention among iron and steel workers. It was the making of the largest Bessemer steel casting ever made in this country. The casting was a cog-wheel, to form part of a blooming mill for their own works, and will weigh, when turned and finished, over 16,000 pounds. The same works have heretofore made crucible steel castings of three or four tons weight, but nothing at all approaching this in size has been cast of either grade of steel.

The Glenwood Steel Works are running double turn.

Mr. Lawson, the boiler exploder, is making preparations for his next test, the date for which, however, he is as yet unable to fix.

WEST VIRGINIA.

Hobbs, Brockmiller & Co. are rebuilding their South Wheeling glass works, lately demolished by fire, as rapidly as possible. Part of the works are at present running again.

The recently formed Standard Iron Company, which proposes to erect a mill for the manufacture of sheet iron across the river from Wheeling, held their first meeting in Wheeling last week. A large proportion of the stock was represented by the subscribers. The following gentlemen were chosen as directors: L. S. Delaplaine, of Wheeling; D. C. List, Jr., of Wheeling; A. Loring, of Wheeling; W. W. Holloway, of Bridgeport; L. Spence, of Martin's Ferry; A. F. Tallmann, of Bellaire; J. R. Mitchell, of Clairsville. This Board of Directors will meet next Monday for the purpose of choosing its officers.

OHIO.

Messrs. Adams & Bailey, of Dresden, are about to establish a large foundry at Newcomerstown. The citizens have responded to the amount of subscriptions called for.—Cleveland Trade Review.

The Tyler Hoe and Tool Works, at Iron-ton, are to be sold at auction this week.

The Otis Iron and Steel Company are rolling Siemens-Martin steel boiler plates 100 inches long.

A stove company is to be organized at Alliance with a capital of \$20,000. Two-thirds of the stock has been subscribed.

Monitor Furnace blew out last week, in order to make repairs. They will reline, put in a new hearth and add two ovens for calcining ore.

H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

SARANAC HORSE NAIL CO.

Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

S. P. BOWEN, President and Treasurer.

PLATTSBURG, N. Y.

W. S. GUIBORD, Secretary.

ELY & WILLIAMS, Gen'l Agents for Eastern and Middle States, 1232 Market St., Philadelphia; 178½ Water St., New York.

36 Oliver Street, Boston. S. H. & E. Y MOORE, Gen'l Agents for Western States, 163 and 165 Lake Street, Chicago, Ill.

SAM'L G. B. COOK & CO., Agents for Southern States. Nos. 67 and 69 (old Nos. 5 and 7) German Street, Baltimore, Md.

SARANAC HORSE NAILS,

Blued or Polished.

Terms, Cash, within 60 Days.

Nos. 5 6 7 8 9 10

Cts. 26 23 21 20 19 18

METALLIC AMMUNITION,

Rim and Central Fire, all Sizes.

GUN WADS, Black and Pink Edge,

Guaranteed Superior to any Imported.

THE UNION METALLIC CARTRIDGE COMPANY,

BRIDGEPORT, CONN.



PRICE LISTS WITH DISCOUNTS TO THE JOBBING TRADE ON APPLICATION.



PERCUSSION CAPS.

F. C. Trimmed Edge, W. Proof.

F. L. Ground Edge, W. Proof, Foil Lined, equal to any imported.

D. W. P. Ground Edge, W. Proof, Central Fire, equal to any imported.

Musket, Paper and Tin Boxes.

Berdan, Orcutt and Wesson Primers.

Bullet Breech Caps.

PAPER and BRASS SHOT SHELLS.

PAPER.

Celebrated "U. M. C." Sizes, 8, 10, 12, 14, 16, 20, Central Fire.

BRASS.

Berdan, Solid Anvil. Sturtevant, Movable Anvil. Buffington, Movable Anvil.

Berdan Primer.

Kenney's Patent Indentation to prevent Wads from starting.

AGENTS: HARTLEY & GRAHAM, New York.

COBB & DREW

Plymouth, Mass.,

Manufacturers of Copper, Brass and Iron Rivets; Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk, Clout and Cigar Box Nails, &c. Rivets made to order.

NEW YORK AGENCY,

GRUNDY & DISOSWAY,

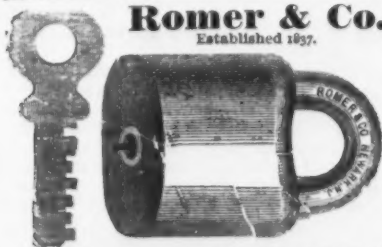
HARDWARE,

165 GREENWICH STREET.

Agents for the Philadelphia Star Carriage and Tire Bolts.

Romer & Co.

Established 1837.



Manufacturers of Patent Scandinavian or Jail Locks, Brass Pad Locks for Railroads and Switches. HANDCUFFS AND LANTERNS. Also Patent Stationary R. R. Car Door Locks. 141 to 145 Railroad Avenue, NEWARK, N. J. Illustrated Catalogue sent to the trade on application.

AXLES

All kinds Wagon & Carriage Axles

Manufactured by the

LANBERTVILLE IRON WORKS.

LANBERTVILLE, N. J.

Send for prices.

MINERS' CANDLES.

superior to any other Light for Mining

Purposes. Manufactured by

JAMES BOYD'S SON,

Nos. 10 & 12 Franklin St., New York.

The Boss Lemon Squeezer.

Malleable Iron and

Tinned (pure Tin).

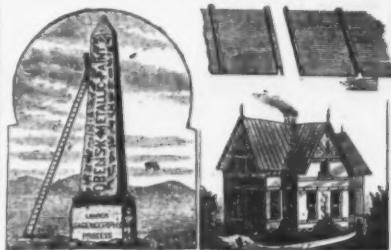


Acknowledged the Best.

Patent Applied For.

JOHN J. TOWER, 96 Chambers St., New York.

ORDER EARLY.



MANUFACTURERS AND OWNERS OF
SAGENDORPH'S PATENT
Self-Capping and Packed Sheet
Iron Roofing.

OBELISK METALLIC PAINT

Under Sagendorph's Process,

For wood, iron and tin, for all purposes where a fire or weather-proof Paint is desired. Obelisk Metallic Paint will stop leaks in all kinds of roofing and will not chalk, crack or peel off.

Important notice to large manufacturers and all in want of a cheap and durable roofing. Superior to Felt, Rubber or Asbestos. More lasting than any other kind of Roofing. Can be laid with 1 inch fall in 50 feet. Send for price list and circular No. 9.

NEW YORK IRON ROOFING AND PAINT COMPANY,
Office, Factory and Salesroom, 137, 139 and 141 E. Pearl Street.
CINCINNATI, OHIO.

The Best Wrought Iron

R A K E S

ARE MADE BY

WHEELING HINGE CO., Wheeling, W. Va.

GLOBE MFG. CO., Middletown, Conn.,

Manufacturers of



THE FAVORITE POCKET WRENCHES

Made both of best Malleable Iron and Cast Steel tempered in Oil. Two sizes, 4 and 6 inch. Also manufacturers of the "Baldwin" Plane Irons and a full line of Socket Firmers and Framing Chisels, Socket Gouges, Cleavers, Draw Knives, &c. Catalogue and discounts to the trade.

REED & CO.,

Manufacturers of

HARDWARE SPECIALTIES.

Send for circular.



HIGGANUM, CT.

Liberal discount to the trade.

REMINGTON ADJUSTABLE

SOCKET WRENCH

For carriage use it has no equal.

In its use there is no wearing of nuts. No greasy fingers. No nuts dropping into dirt. No necessity of having a close wrench for each carriage. All owners of carriages or wagons will find in this an article which will prove satisfactory in every particular. Are made of best malleable iron. Two sizes.

HANDLES FOR MANUFACTURERS.

From Selected Stock, Thoroughly Seasoned, Well Made.

Orders solicited from close buyers who want good work.

RIPLY MANUFACTURING CO.,

Unionville, Conn.,

Manufacturers of

"Common Sense" Mouse Traps, Mallets, Porcelain-Lined Lemon Squeezers, Boot Jacks, Faucets and Hardware.





SPENCER & UNDERHILL.

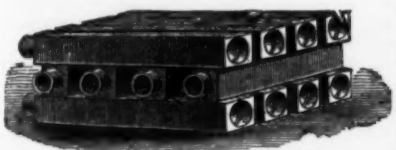
94 Chambers St., New York, Agents for American Screw Co.'s Wood Machine and Rail Screws, Stove and Tire Bolts, Rivets, &c. G. F. Warner & Co.'s Carriage Clamps.

DEPOT FOR

O. Ames & Son's Shovels, Spades and Scoops. A. Field & Son's Tacks, Brads, Nails, &c. Nicholson File Co.'s Files and Rasps. W. S. Hatcher's Chisels, Gouges, Plane Irons and Clavers. E. W. Gilmore & Co.'s Strap and T Hinges. Russell Jennings' Auger and Dowel Bits. Also a general assortment of Hardware.

A. WYCKOFF,

Manufacturer of



WOOD WATER PIPE

For Coal and Iron Mines.

Send for pamphlet.

A. WYCKOFF, Elmira, N. Y. R. COOK & SONS,

Manufacturers of

Carriage & Wagon AXLES,

WINSTED, CONN.

ESTABLISHED - - - 1830.

N. Y. MALLET and HANDLE WORKS



Manufacturers of

Calkers', Carpenters', Stone Cutters', Tin, Copper and Boiler Makers' MALLETs,

Hawking Beets, Hawking and Calking Irons; also all kinds of Handles, Sledge, Chisel and Hammer Handles. Also

COTTON AND RAIL HOOKS. Patented Feb. 13, 1877; a new combination of Hooks. 436 E. Houston St., New York City.

55 WARREN ST., NEW YORK CITY. F. R. EMMONS.

TACKS

E. PHILLIPS & SONS, Manufacturers, SO. HANOVER, MASS.

The Patent Combined Dinner Pail and Lantern.

The most perfect Dinner Pail in the world. Hot coffee for dinner and a Lantern at night.

Manufactured by JOS. HAIGHT, PORT CHESTER, N. Y.

Sent by express on receipt of \$1.00. Agents wanted.

Keystone Screw Co.

17th and Venango Streets, PHILADELPHIA.

J. BILLERBECK,

Manufacturer of Iron Gimlet-Pointed Wood Screws

W. & J. TIEBOUT,

Manufacturers of

Brass, Galvanized & Ship

Chandlery Hardware,

No. 33 Chambers St., New York.

Vulcanized Rubber Fabrics

ADAPTED TO MECHANICAL PURPOSES.

RUBBER BELTING and PACKING.

Machine Belting, Steam Packing, Leading Hose, Suction Hose, Grain Elevator Belting, Steam Hose, Piston Rod Packing, Gaskets and Rings.



Vacuum Pump Valves, Ball Valves, Car Springs, Wagon Springs, Gas Tubing, Machine Belting, Wringer Rolls, Billiard Cushions, Grain Drill Tubes, Emery Wheels.

This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than twelve years, also those for Armour, Dole & Co., Chicago, and Vanderbilt's great elevators of the New York Central and Hudson R. R., New York, being the largest belts in the world. We are now making an Elevator Belt 36 inches wide and 2,500 feet in length, which will weigh over 15,000 pounds.

LINEN and COTTON HOSE.



Plain and Rubber Lined.

Circular Woven-Seamless Antiseptic RUBBER LINED "CABLE" HOSE and "TEST" HOSE, Vulcanized Para Rubber and Carbolized Duck, for the use of Steam and Hand Fire Engines, Force Pumps, Mills, Factories, Steamers, Ships, Hospitals, &c.



"TEST" HOSE.

"CABLE" ANTISEPTIC

Emery Wheels and Packing.

ORIGINAL

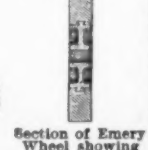


Patented.

Solid Vulcanite EMERY WHEELS

Emery Wheel.

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.



Patented.

The properties of these wheels are such that they can be used with great advantage and economy for cutting grinding, and finishing wrought and cast iron, chilled iron, hardened steel, slate, marble, glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Plows, Saws, Stoves, Fire Arms, Wagon Springs, Axes, Skates, Agricultural Implements, and small Machinery of almost every description.

Pat. Jan. 26, 1869.

PATENT ELASTIC

Pat. Jan. 26, 1869.

Rubber Back Square Packing

BEST IN THE WORLD.

For Packing the Piston Rods & Valve Stems of Steam Engines & Pumps. B represents that part of the packing which, when in use, is in contact with the Piston rod. A the elastic back which keeps the part B against the rod with sufficient pressure to be steam tight and yet creates but little friction. This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.

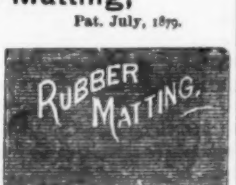
Pat. 11,208, 213,601

For Halls, Flooring, Stairs and

Pat. July, 1879.



Iron Stairways, &c.



This practical and indispensable article—especially for wear where exposed to ice, snow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, whilst the cheap inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address:

NEW YORK BELTING & PACKING CO.,

Warehouse, 29 Park Row, New York.

JOHN H. CHEEVER, Treasurer.

H. P. GREGORY & CO., San Francisco, Cal., General Agents for Pacific Coast.



BUCK BROTHERS, Millbury, Mass.

The most complete assortment in the U. S. of

Shank, Socket Firmer and Socket Framing Chisels,

PLANE IRONS.

CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons, who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark, also "Riverlin Works."

PHOSPHOR-BRONZE.

The Phosphor-Bronze Smelting Co.,

Limited,

Owners of the

U. S.

TRADE

MARKS

Sole

Manufacturers of

Phosphor

Bronze

in the

United States.

Bronze Patents. "Phosphor-Bronze."

Office and Salesroom,

512 Arch Street, - - - PHILADELPHIA, PA.

THE STRONGEST, TOUGHEST, BEST AND MOST DURABLE METAL.

PHOSPHOR BRONZE SPRING WIRE AND WIRE FOR WEAVING, &c.

Pump Rods, Tubes, Serews, Jack Chains,

Rolled Bolts, Nails, Wire Cloth, Sash Cords,

Sheets, Boat Nails, Pens, Wire Ropes,

Plates, Tacks, Sash Chains, Cast Kettles.

INGOTS FOR CASTING.

Send for Pamphlet and Price Lists.

PHOSPHOR-BRONZE.

Brown, Bonnell & Co.'s link and pin factory, Youngstown, will be in operation next week. The firm have commenced the erection of a new spike factory.

The Falcon Iron Company, Niles, have added four new furnaces to their mills.

Messrs. Loeder & Levy, iron dealers, and Mr. Davis, all of Cleveland, have started up the rolling mill at Cuyahoga Falls.—*Cleveland Trade Review*.

Dispatches state that the old rail mill at Marietta, which has been idle for so long, has been purchased by a company made up of Pittsburgh and Wheeling men, who will put it in shape and start it up at once.

Mr. W. D. Kelly has in view the establishment of a new furnace and nail works in Ironton of such capacity as to make it a matter of great importance. The project is not in such shape as to make success assured, but there are many indications of its final accomplishment.—*Ironton Register*.

The Thomas Furnace Company, Niles, have ordered a new blast engine from the Columbus Machine Company.

KENTUCKY.

Ashland Furnace is making about 390 tons per week.

TENNESSEE.

The Polar Creek Coal and Iron Company has been organized with a capital of \$1,000,000, at Knoxville, Col. G. J. Foreace, of Atlanta, president of the Rabun Gap Railroad, of Tennessee, and Northwestern Railroad, of Georgia, was elected president.

ILLINOIS.

The Rockford Tack Company, at Rockford, having purchased the machines of the Pottstown (Pa.) Tack Works, have them in position, and are now running fifty machines full time, with orders pressing.

INDIANA.

High water in the Ohio River last week caused much trouble in the American Plate Glass Works of W. C. DePaw at New Albany, and in a less degree at Jeffersonville. In the former place some damage resulted from the flood, and at one time it was feared that the rising waters would extinguish the fires in the furnaces, in which event the loss would have been very serious. Considerable damage was occasioned to other interests in these places.

The Chicago Screw Co. have increased their facilities 25 per cent. during the past two months, and are still adding new machinery to their works, in which sixty men are now engaged.

The Duffy Tool Company, South Chicago, has suspended business for two weeks in order to put in some new machinery.

MISSOURI.

The barb wire manufacturers of St. Louis are running on full time and are very busy. The St. Louis Wire Fence Company are adding new machinery.

Two of the Carondelet blast furnaces have been compelled to shut down on account of the very bad condition of the roads in the southwest part of the State, which cuts them off from their supply of ore.

TEXAS.

We hear that Kelly Furnace, owned by the Jefferson Iron Co., at Jefferson, is to be sold under a deed of trust. The property consists, besides the furnace, of 2000 acres of ore and timberlands.

LABOR AND WAGES.

Delegates representing nearly all the coal companies in Luzerne and Lackawanna counties met in Wilkesbarre on the 3d inst. in convention. They took into consideration the propriety of organizing a workingman's union. The meeting was adjourned to reassemble in general mass meeting at Pittston on the 15th inst. It is a foregone conclusion that they will demand an increase of wages of from 10 to 20 per cent.

The managers of the Lochiel Iron Works, Harrisburgh, issued an order on the 5th confining the pay of the puddlers to the iron in a finished condition. They had previously been paid for the weight of the iron in a crude condition as it comes from the furnace. The order requires it to first go through the squeezers and rolls, and if a chill occurs, or it is not perfect when finished, the puddlers lose their work. The workmen deemed the order an unreasonable one, and demanded that it be rescinded. This was not done, and nearly all the puddlers went out.

Extended mention will be found elsewhere of the serious difficulties now existing at the works of the Pittsburgh Bessemer Steel Company, at Homestead, Pa.

The great strike at the Phoenix Iron Company's seven large mills, Phoenixville, Pa., closed on the 7th in a complete victory for the company. The mills are all now running at full capacity. A large number of newly arrived foreigners have taken the places of the strikers. A number of the leading officers of the Iron Workers' Union have been discharged, not only by the Iron Company, but by the Philadelphia and Reading Railroad Company, in order to break up the union. The strikers are being refused work at various other mills in the Schuylkill Valley.

The striking rolling mill hands of the Union Iron and Steel Company's works, Chicago, attacked a number of men who have been engaged to fill the places left vacant by the strikers, on the 28th ult. The police were called in to quell the riot, but were not in sufficient force to properly protect the workmen, who were hooted and pelted by the mob. The strike is at present writing unsettled, and the furnaces of the company have banked up.

At Omaha, on the 1st inst., a crowd of 100 men, who struck for a raise of pay from Contractor Stephenson on grading for the railway depot grounds, unhitched the horses and threw the scrapers of those that stayed at work into the pond, and in the afternoon, reinforced by the 500 men, marched to the sewer constructing and compelled forty laborers to quit. Mayor Boyd read the riot act to the crowd and ordered them to disperse. The police were resisted and clubs and revolvers produced, when the Mayor arrested one of the chief rioters and sent him to jail. Four rioters were arrested. The prompt action of the Mayor checked what would have developed into a general riot with serious results.

The Pig Iron Production of 1881.

The Secretary of the American Iron and Steel Association will publish in a day or two full returns of the production of pig iron last year in the United States. The total production, although a little more than 8 per cent. greater than in 1880, was less than was generally looked for. The production in each of the last three years is given below in net and gross tons (a net ton being 2000 pounds and a gross ton 2240 pounds) with the number of net tons produced with each of the three kinds of fuel:

Years. [N. tons, Gs. tns.] Bltm's, Anth'e, Ch'e'l.
1879..... 3,770,875 4,741,853 1,438,978 1,273,724 338,873
1880..... 4,095,414 5,035,101 1,950,205 1,807,681 337,358
1881..... 4,641,554 5,144,554 2,268,264 1,734,459 638,831

Coke, it should be stated, is used as a mixture in many anthracite furnaces. Commenting on the figures given above, Mr. Swank will say: An increase of little more than 8 per cent. in 1881 makes a poor showing in comparison with the wonderful increase of 40 per cent. in 1880. But the failure of our pig iron industry to maintain in 1881 a rate of increase even approximate to that of 1880 is easily explained. The year 1879 was partly spent before our pig iron manufacturers awakened to the fact that a "boom" in the iron trade had begun, and even after this fact was fully realized, valuable time was lost in making needful preparations to put idle furnaces in blast. Consequently the production of 1879 was not much greater than that of 1878, or any other of the years of depression. But in 1880 our best furnaces were all in operation, and were driven to their utmost capacity. Hence the remarkable product of that year. In 1881 this activity was continued, except in some districts during the second and third quarters of the year, but a better record than had been made in 1880 could hardly be expected from the furnaces that were running in that year, so that the increased production of 1881, if any, would have to come mainly from new furnaces. It was, as we have seen, about 8 per cent. We had estimated that it would be about 16 per cent.

Pig iron was made last year in twenty-six States and Territories, California, Colorado and Washington Territory producing the metal for the first time. The North Carolina furnaces also produced pig iron for the first time since 1877. The largest increase in tons was in Pennsylvania, which produced 1,076,665 net tons more than in 1880. Nearly all of this increase was in Allegheny County. But the largest percentage of increase was in Virginia, Alabama, Georgia, Tennessee, Illinois, Michigan, Connecticut, Minnesota and Oregon—the last two States, of course, producing but little pig iron in either year. Of 701 furnaces in the United States on December 31, 1880, there were 446 in blast and 255 out of blast; of 716 furnaces on December 31, 1881, there were 457 in blast and 259 out of blast. The stocks of pig iron unsold in the hands of makers or their agents on the 31st of December, 1881, amounted to 210,896 net tons, against 456,658 tons at the close of 1880, and 141,674 tons at the close of 1879. In 1881 there were built twenty-five new furnaces in the United States. The building of twenty-three other furnaces was begun but not completed. In the same year twelve furnaces were abandoned. During the year the probable consumption was 4,982,565 gross tons—an increase of about 1,000,000 gross tons. About one-third of this increase was used in the production of Bessemer steel; the remainder was required to supply the miscellaneous iron and steel works of the country.

Public Debt and Revenue.

The United States owes, in excess of cash on hand, \$7,783,511 less than it did January 31. But this reduction is mainly due to a large increase of cash in hand, namely:

Gold coin and bullion, increase..... \$8,605,085.45
Silver coin and bullion, increase..... 2,465,621.46
Bank notes, increase..... 1,858,579.10
United States notes, increase..... 967,453.71

Total increase..... \$13,916,740.02

Nearly the whole of this large sum the Treasury has drawn from the market during the past month, and is now about to pay out for pensions, or for principal or interest of the public debt. The increase in gold on hand is rather surprising, in view of the fact that exports have largely exceeded imports during the past month, and even in January the excess in imports of gold was only about \$1,000,000. Some gold bullion was received, for the coinage of gold, \$6,674,037, exceeds the increase in gold bullion on hand, \$5,464,443. But the increase in gold coin on hand was \$14,069,529, which shows an unexpected accumulation in excess of new coin received from the mint. While only 2,300,000 silver dollars were coined in February, the increase in standard silver dollars on hand was \$2,716,373, and the gain in fractional silver nearly balances the loss in silver bullion on hand. The accumulation in bank and legal-tender notes, over \$2,800,000, is not balanced by any increase in the amount due banks, which is lower than it was a month ago. Amounts due to disbursing officers are only \$2,200,000 larger than they were February 1.

The Treasury has paid very little debt during the past month; in fact, the changes in debt are insignificant. Large revenues have poured into the Treasury a sum much beyond its immediate needs. The receipts for the month of February, compared with those of the corresponding month last year, have been:

Customs..... 1881. \$15,345,931 1880. \$10,160,493
Internal Revenue..... 9,148,670 9,136,208
Miscellaneous..... 3,486,600 2,906,862
Total..... \$28,175,201 \$22,203,563

The gain, it will be observed, has been exclusively in customs duties. For the first time in many months, the receipts from internal taxes show a decrease, and there is also a decrease in miscellaneous receipts. The gain of \$3,800,000 in customs duties is due to the heavy importations recently made; the value of imported goods in January was \$56,767,086, against \$45,284,228 in January of last year. The gain of \$11,482,228 in imports, with a loss of \$9,370,297 in exports for the same month, does not indicate a very healthy state of foreign trade.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, March 9, 1882.

DAVID WILLIAMS - Publisher and Proprietor.
JAMES C. BAYLES - Editor.
JOHN S. KING - Business Manager.

RATES OF SUBSCRIPTION INCLUDING POSTAGE.

THE UNITED STATES, BRITISH AMERICA AND
SANDWICH ISLANDS.
Weekly Edition.....\$4.50 a year.
Issued every TUESDAY morning.
Semi-Monthly Edition.....\$2.30 a year.
Issued the First and Third THURSDAY of every month.
Monthly Edition.....\$1.15 a year.
Issued the First THURSDAY of every month.

TO ALL OTHER COUNTRIES.
PER ANNUM, POSTPAID.
Weekly Edition: \$5.00—£1—francs—30 marks—12
florins—6 roubles (coin)—24 lire—20 pesetas.
Semi-Monthly Edition: \$2.50—10/—12 1/2 francs—10
marks—3 florins—3 roubles (coin)—12 1/2 lire—10
pesetas.
Monthly Edition: \$1.25—5/—6 francs—5 marks—3
florins—1 1/2 roubles (coin)—6 1/2 lire—5 pesetas.

REMITTANCES
should be made by draft, payable to the order of David
Williams, on any banking house in the United States
or Europe; or, when a draft cannot be obtained, in
postage stamps of any country.

NEWSDEALERS OR BOOKSELLERS
In any part of the world may obtain *The Iron Age*
through the American News Company, New York, U.
S. A.; the Wilmer & Rogers News Company, New
York, U. S. A.; and London, England; or the San Fran-
cisco News Co., San Francisco, California, U. S. A.

RATES OF ADVERTISING.
One square (12 lines, one inch), one insertion, \$2.50;
one month, \$7.50; three months, \$15.00; six months,
\$25.00; one year, \$35.00; payable in advance.

DAVID WILLIAMS, Publisher,
53 Reade Street, New York.
PITTSBURGH.....77 Fourth Avenue
J. D. WESS, Manager and Associate Editor.
PHILADELPHIA.....300 South Fourth Street
THOS. HOSMAN, Manager.
CHICAGO.....35 & 38 Clark st., cor. Lake
HENRY SMITH, Manager.
CINCINNATI.....Builders' Exchange
T. T. MOORE, Manager.
CHATTANOOGA.....Eighth and Market Streets
S. B. LOWE, Manager.
BRITISH AGENCY.
The publishers of *The Iron Age*, 44 Cannon Street,
London, England, will receive orders for subscriptions
and advertisements on our regular terms.

CONTENTS.

First Page.—Steam Hammer at the Parkhead
Forge, Scotland.
Third Page.—The New French Tariff.
Fifth Page.—Hass' Improved Stop Valve.
Railroads Sold Under Foreclosure in 1881.
Seventh Page.—Railroads Sold Under Fore-
closure in 1881. (Continued). Small Job Crane.
The Scotch Pig Iron Trade, 1881. Exports from
the United Kingdom to the United States for Jan-
uary.
Ninth Page.—The National Bankruptcy Bill.
American Steel for American Ships.
Eleventh Page.—American Steel for Ameri-
can Ships (Continued). Industrial Items.
Thirteenth Page.—Industrial Items (Conclu-
ded). Labor and Wages. The Pig Iron Pro-
duction of 1881. Public Debt and Revenue.
Fifteenth Page.—The Reduction of Internal
Taxation. The Holley Patent for Removable
Converter Linings. American Steamship Com-
munication. The Homestead Strike and the Amal-
gamated Iron Association. Is a Tariff Purchase, Gift or Theft?
Canadian Views of Reciprocity.
Seventeenth Page.—A Deep Mine in Prizbram,
Bohemia. The Peter the Great. Alexander
Lyman Holley.
Nineteenth Page.—Alexander Lyman Holley
(Continued). An Old Locomotive. Washington
Notes.
Twenty-first Page.—Trade Report.—British
Iron and Metal Markets. Financial. General Har-
ware. Iron. Metals. Foreign Trade Movements.
Old Metals, Paper Stock, &c.
Twenty-second Page.—Exports. Imports.
Coal. Philadelphia. Pittsburgh.
Twenty-third Page.—Pittsburgh (Continued).
Chicago. Chattanooga. Boston. Cincinnati.
Louisville. St. Louis. Baltimore. Our English
Letter.
Twenty-fourth Page.—Our English Letter
(Continued). Foreign. Scientific and Technical.
Twenty-fifth Page.—The Iron Age Direc-
tory.
Twenty-sixth Page.—New York Wholesale Prices.
Twenty-seventh Page.—New York Wholesale
Prices (Continued).
Twenty-eighth Page.—New York Wholesale
Prices (Continued).
Twenty-ninth Page.—Philadelphia and Pitts-
burgh Hardware and Metal Prices.
Thirtieth Page.—Boston Hardware and
Metal Prices.

The effects upon the cotton crop of the
disastrous floods in the Mississippi Valley
excite gloomy forebodings in that part of the
country. Nearly the entire alluvial district
between Memphis and Vicksburg is under
water, and the Memphis correspondent of
the New Orleans *Times-Democrat* says the
planted area of that district will be 20 per
cent. less than last year. The editor, re-
marking upon the present outlook, says it is
far from encouraging. He "seriously"
believes that the crop of 1882 will be even
"smaller than that of the year just past,"
which will fall short more than 1,000,000
bales, compared with the crop of 1881.

The Reduction of Internal Taxation.

The reports of the internal revenue and
customs receipts for the last few months
shows the necessity of making haste slowly
in deciding what reduction shall be made in
the internal revenue taxes. The schemes
proposed for the reduction of the whisky,
tobacco and beer taxes have been predicated
on a continuance of the receipts from these
sources remaining the same, but the last re-
ports indicate a decided falling off. These
reports regarding internal revenue show
that in the first four months of the current
fiscal year there was a monthly increase in
the internal revenue receipts, ranging from
\$1,013,725 in July to \$2,522,495 in October.
Since the latter month there has been a per-
ceptible falling off in the receipts. The in-
crease in November, 1881, as compared with
the same month in 1880, was only \$683,600.
In December the increase was only \$302,711,
in January \$655,125, and in February there
was a decrease in the receipts, as compared
with those of 1881, amounting to \$274,650.
This is the first decrease in the receipts since
the agitation of a reduction in the tobacco
tax, two years ago. It is asserted that this
decrease is wholly attributable to the un-
settled question of taxation, and unless
speedy action on the subject is taken by
Congress, there is reason to fear that a
greater decrease may occur in the near fu-
ture. This may be true, at least to a con-
siderable extent. No doubt whisky is al-
lowed to remain in bond in anticipation of a
reduction in the tax, but it does not apply
to the customs. It is not the unsettled
tariff questions in Congress that have
led to the decline in our exports or
the change in the balance of the gold move-
ment. The Chief of the Bureau of Statistics,
in his seventh monthly statement for the
current fiscal year of the imports and exports
of the United States, says the excess of
exports of merchandise was as follows:

| | |
|---|-------------|
| Month ended January 31, 1882..... | \$7,941,579 |
| Month ended January 31, 1881..... | 28,794,104 |
| Seven months ended January 31, 1882..... | 73,279,543 |
| Seven months ended January 31, 1881..... | 190,505,856 |
| Twelve months ended January 31, 1882..... | 129,485,403 |
| Twelve months ended January 31, 1881..... | 299,881,665 |

The excess of imports or exports of
gold and silver coin and bullion was as fol-
lows:

| | |
|--|------------|
| Month ended January 31, 1882 (excess of exports)..... | \$617,990 |
| Month ended January 31, 1881 (excess of imports)..... | 4,338,943 |
| Twelve months ended January 31, 1882..... | 44,457,215 |
| Twelve months ended January 31, 1881..... | 73,347,200 |

The excess of imports over exports, Janu-
ary, 1882, was only one-quarter what it was
in 1881. For the twelve months ending
January 31, 1882, it is 25 per cent. less than
for the corresponding period ending January,
1881, while the decline in the seven months
ending January 31, 1882, or the seven
months of the fiscal year, was considerably
over 50 per cent. It may be advisable to
reduce internal taxes, but it must be done
with a good deal of discretion and care. We
do not know what is before us, and already
there are indications that a wise legislature
should heed.

The Holley Patent for Removable Converter Linings.

The Bessemer Association, at their meet-
ing last week, voted to purchase of Mrs.
Holley for \$50,000 the A. L. Holley patent
for improvements in the construction of Bes-
semer converters, by which the basic process
can be adapted to American practice without
sacrifice of product. We note this fact with
much pleasure, as from the nature of a contro-
versy which arose before Mr. Holley's death,
there was reason to fear that such a pur-
chase would be opposed, on the ground that
as Mr. Holley was employed by the Bessemer
Association, any inventions and improve-
ments he might make while under pay
belonged to them. Mr. Holley promptly and
properly resented this view of his position
toward the association by tendering his resig-
nation as their engineer, and offering to return
their check last received if it was accepted. It
was not accepted, and as his next quarter's
salary was paid when due, he assumed that
they had no desire to dispense with his in-
valuable services. It is probable his right to
control his patent would have been further
disputed had he lived, but his death
reconciled all differences, and the decision
of the association to pay for his patent the
price he asked for it, is creditable. The
fact that it was worth the price does not
change the matter any, for everything
Holley did for the Bessemer interest during
his life was worth a great deal more than
he asked for it, and he died its creditor to an
extent which even those in the business
scarcely appreciate. The \$50,000 to be paid
his family for his last invention, making
useful and practicable an invention which
had been purchased from Mr. Thomas for
\$275,000, will go only a very little way
toward discharging the obligation of the
Bessemer steel trade to A. L. Holley; but it is
better than nothing, and perhaps all that
can be expected.

Our ironmasters have received a sufficient
intimation from the debates in Congress
that their services may be needed for the
manufacture of heavy ordnance, as well as
armor-plates. If we are to have a navy, we
must have naval armaments, and for these
there is no need to go abroad. Iron manu-
facturers, therefore, will be prepared to ex-
tend their plant in either direction, when
the conclusion is reached that ships and
guns are needed.

American Steamship Communication.

The latest reports from United States con-
suls, whether located in the Eastern or West-
ern hemisphere, nearly all give prominence
to the subject of establishing direct lines of
American steamers to foreign ports. They
concur in representing that it is of the
utmost importance to our export trade that
we should have facilities wholly independent
of our rivals for introducing abroad articles
of merchandise suited to the foreign demand.
The money paid to foreign shippers, if not
extortionate, at least amounts to a formid-
able sum, estimated at \$90,000,000 to
\$100,000,000, but this, large as it may appear,
is of far less consideration than the disad-
vantage at which our manufacturers and
traders are placed, in their lack of means
for reaching the markets of the world. It is
shown that excessive freight charges alone
exclude American corn from the remoter
provinces of Germany, which now depend
on Hungary and Roumania, although the pro-
duct of the United States is pronounced far
superior. So, too, of South America. Europe
has thirteen lines of steamers run-
ning to Buenos Ayres alone; we have none
on the entire coast, while foreign lines
are multiplying under the encouragement
of a prosperous traffic. As stated by our con-
sul at Bahia, where some twenty-five large
European steamers touch every month, but
where the American flag of late years is
rarely seen: "A most powerful factor to
very largely increase the trade between the
United States and all South America would
be the establishment of lines of steam
vessels under our flag. I quite agree with
all of our consuls who have written on
this subject. Without exception, so far as
I have seen, they advocate the extension
of Government aid to certain lines of such
vessels. I believe some millions could be
"so employed with immense advantage to
the general interests of the American
people." The United States Consul at
Hamburg, in like manner, deprecates the ab-
sence of the American flag from that har-
bor, and invokes wise and judicious legisla-
tion to effect its restoration.

Irrespective of any Governmental action
that may be taken for the upholding of our
ocean marine, it is all important that Ameri-
can houses should establish agencies, so
far as practicable, at all prominent foreign
ports, for the introduction of our manufac-
tures; but so long as we are handicapped by
rivals, in exclusive control of the means of
transportation, success must be limited and
unsatisfactory. It is fortunate that so much
light is afforded by consular reports at a
time when Congress is deliberating upon the
needs of American shipping.

The Homestead Strike and the Amal- gamated Iron Association.

Our readers have already been advised of
the existence of a strike at the works of the
Pittsburgh Bessemer Steel Co., Limited, at
Homestead, a suburb of Pittsburgh. The
strike is not over a question of wages, but
over an article of agreement which the pro-
prietors require every employee to sign. As
at first drawn, this article required the
employees not to be members of the Union;
but this feature was abandoned, and the chief
requirement was three days' notice of leaving
and that not less than three should leave at
the same time. It was against this that the
strike took place. An after grievance
against the company was a refusal on their
part to receive and negotiate with a commit-
tee of the Amalgamated. In a word, the
strike resulted from a refusal to recognize
the Union as a party to the control of their
works, for this is at the bottom of the whole
struggle.

The strike has developed a spirit of law-
lessness that has happily been absent from
the recent contests of the Amalgamated
Association. This lawlessness is deprecated
by the officers of the association, and we have
no doubt that President Jarrett, and many
of the better men, are honest in their denun-
ciation of the crimes and disturbances that
have marked this strike; but the results of
the intimidation are for their benefit, and
the perpetrators are known and shielded by
members of the association, and it is held,
and justly too, as morally responsible. As the
Sunday Leader, of Pittsburgh, says:

It will be said that the violence at Homestead
was not perpetrated by the strikers. Tell that
to the marines. Not only is the universal testimony
that it was some of the strikers that began the
clubbing and stoning, but in the very nature of
things it could hardly have been any one else.
No one has any reason to club and stone work-
men quietly attending to their business, except
men who want their places. It was the strikers—
not all of them, of course, for there are many
excellent men among them—but some of them
that began the violence. Who these men are
must be known to the rest. They could easily be
known to the Amalgamated Association. But
they are not pointed out. They are not punished.
They do not lose either caste or place in the as-
sociation. Therefore, so far as the public is con-
cerned, the Homestead branch of the association
must bear the odium of the violence it does not
revoke; and if the general association orders a
general strike to aid the Homestead branch, it
must bear the odium of condoning that violence.
Endeavor to make it prove successful. Public
opinion will be decidedly adverse to a strike for
that object.

But it is to the last feature of this strike
and its importance that we wish to direct
attention. Saturday evening a delegate
meeting of the Amalgamated Association
was held in Pittsburgh, at which some
two hundred delegates were present. After
a long discussion, the following resolutions
were passed:

Resolved, That all mills in this city whose
proprietors hold stock in the Pittsburgh Bessemer
Steel Company, at Homestead, be closed on and
after the 15th prox., except they bring about
some means of settlement of the difficulties now
existing at the Homestead Works.

Resolved, That the committee of said mills in
this city, viz.: Singer, Nimick & Co., Hussey,
Howe & Co., Wm. Clark & Co., and Superior Rail
Mill, notify said firms, through their manage-
ment, of the action of this meeting, as couched in
the former resolution.

Resolved, That these resolutions also refer to
the troubles now existing in the Oliver Wire Mill,
this city, whose employees are shut out for join-
ing the Amalgamated Association.

Miller, Metcalf & Parkin are also owners
in this mill, but as their works are run out-
side of the Amalgamated Association, it will
not have much, if any, effect there. The
meaning of this action is that the parties
who own stock in these mills must com-
pel the manager of the Bessemer Works to
bow to the Amalgamated's bidding, or else
all the works must close. Because, for ex-
ample, Mr. H. W. Oliver and one of his
brothers own stock in the Oliver Wire
Works, though another of his brothers and
Mr. Phillips, who are partners in the firm of
Oliver Bros. & Phillips, do not own a dollar
in the Oliver Wire Works, the mills of the
Oliver Bros. & Phillips must close down.
This is an outrage. Worse than that, it is a
crime.

Is a Tariff Purchase, Gift or Theft?

In his speech last week before the Re-
venue Reform Club of Brooklyn, Professor
Sumner is reported to have said: "There
are only three ways by which my prop-
erty may leave me. A man may buy it of
me; or I may give it to him; or he may
steal it from me. You must put the tariff
under one of these three heads, and truth
demands that it shall be put under the
third." Professor Sumner is a professor
of political economy, we believe, at Yale
College, and is not supposed to speak at
random; but if he means that the three
ways mentioned are the only ways in which
his property may leave him, or if he claims
that his generalization is exhaustive, he is a
random talker of the boldest character.
Suppose, for example, Professor Sumner is
a defendant in a civil suit involving prop-
erty, and the court and jury decide that he
must pay \$1000 of his money to the plaintiff.
Is this bought, or given, or stolen? It may be
possible that Professor Sumner in this case
will say the money was not his. It belonged
to the plaintiff, and he was compelled to
restore it. But suppose that he did not
believe that it was just that he should
deliver \$1000 to the plaintiff and that the
money was his, would it be stealing? Again,
in the case of taxes; are these bought,
given or stolen? Professor Sumner may
willingly pay his taxes and call them a gift
to society, but how with the Misses Smith in
his own State, who have refused to pay their
taxes on the ground that it was unjust to
compel them to do so, and have allowed
their cows to be seized by the law and sold
to meet the taxes. Did the law buy this
property? did the Misses Smith give it? or
did the law steal it?

We presume Professor Sumner's answer, in
effect, will be that as these ladies lived in
society and were protected by it they owed
certain duties to it, which if they could
not be rendered in services must be in money,
and that though this money was in posses-
sion of the Smiths it really belonged to
the State and the State took its own.
But suppose the Smiths do not believe
this. Suppose they claim that taxation and
representation are inseparable, he would
say—or perhaps he would not, as they are
women, but he would if they were men—that
it makes no difference whether you ac-
knowledge the obligation or not. So long
as you live under the government of this
State you must bear your share of the bur-
dens.

We cannot follow this argument out fully,
but we suggest that it may be just barely
possible that any duties that may be taxes
may come under the same head as the Smith
cows. That it is conceived to be for the
good of the people that this duty be levied,
and this being so, the duty is the property of
the people, and it only takes its own, and so
a tariff may not be theft. It may be that
Professor Sumner will claim that this tax is
for the benefit of the few. So in just the same
sense some of the other taxes levied for the
benefit of the Government are for the few.
Professor Sumner may have \$100,000 of
taxable property in the city of New Haven
and no children to send to school. His next
door neighbor may have a half-dozen chil-
dren in school and only pay a poll tax. Is
Professor Sumner robbed by the amount of
school tax he must pay? He may answer
that education is necessary for the well-
being of the State. So is a protective tariff.
If Professor Sumner denies the latter he will
find men in his own State who will deny the
former. If one is theft the other is.

The folly of tariff discussion in a free-
trade newspaper is shown very forcibly in
the dispute which for some time past has
been going on in the columns of the New
York *Times* over the subject of the duty on
steel rails. The *Times* sends out a corres-
pondent to write about the iron and steel
industries of the country, and selects a man
who knows nothing about them. He forth-
with begins to write, and at considerable
length tells the public what an infamous
monopoly the Bessemer interest is, and how
it has become so because of the tariff. Of
course he is mistaken—such free lance

usually are. The only monopoly which ever
existed in this industry was a monopoly cre-
ated by our patent laws. Having purchased
the Bessemer and Kelley patents, and the
patents covering all subsequent improve-
ments of value, they enjoyed the advantage
secured by our patent laws so long as these
patents lasted. To say that the tariff helped
to make their business a monopoly is absurd.
Immediately a flood of letters poured in upon
the editor. It was clearly shown that there
is no monopoly about it, that any one who
wishes to can make Bessemer steel rails
without paying royalty or asking leave of
anybody, and that all the patents now owned
by the Bessemer Association can be used
upon payment of 50 cents per ton royalty.
This has been authoritatively stated a great
many times, but the *Times* is still receiving
and publishing letters about the Bessemer
monopoly. Unless sensible men stop writing
letters, the controversy will be indefinitely
prolonged by fools, and as soon as one of the
latter class is demolished by facts, another
will calmly and smilingly step forward to
take his place. Whether the duty on steel
rails is too high or too low is a proper subject
for discussion, but to reiterate the statement
that a business open to any one who chooses
to engage in it is an infamous monopoly, is
not only to state what is untrue, but if it
were true the blame would fall upon our
patent laws and not upon the tariff. The
only monopoly the Bessemer Steel Company
ever had was one which cost them consider-
ably over a million dollars in money paid for
patents which no one else wanted to buy.

Canadian Views of Reciprocity.

The position of Canadian statesmen on the
question of reciprocity with the United
States reminds one of a coquettish, coy maiden
who desires attention, but is painfully stud-
ious to conceal the fact. An avowed desire
on the part of the Dominion would cost them
half their vantage ground. The true inward-
ness of the situation is disclosed incidentally
by Hon. L. S. Tilley, Minister of Finance, in
his discussion of the tariff, as follows: "If
the people of the United States were in a
position to say to us to-day, or any other
day, that they would go back to the reci-
procity treaty of 1854, by which the
natural products of the two countries
would be admitted into both countries free,
we would be prepared to agree to the
arrangement, but it would be the greatest
mistake that any government could make
at this time, while negotiations may be
pending at no distant day, while notice
may be given of the abrogation of the
Washington treaty, and when and while,
as I judge from conversations I have had
with leading men of the United States, the
next proposition will be one for extended
trade relations between the two countries,
it would not only be a mistake, it would be
madness, to yield one iota of the vantage
ground we have now. If we were to yield
it now we would do that which we would
regret to the end of our days. Therefore,
under no circumstances are we prepared
to offer any proposition for the reduction
of the duties now levied on any of these
articles." We learn from the foregoing
that the present government of the Dominion
have a strong yearning for reciprocity; they
are consulting with leading men in the
United States on the subject, and are anx-
iously waiting for overtures from beyond the
boundary line. They would consider it a
grave political mistake, however, to acknowl-
edge the fact.

The Doxology of All Tariff Legis- lation.

The Ways and Means Committee, at its
session last Thursday, postponed action on
Mr. McKinley's request for permission to
report his bill to the House. It is understood
that this action was taken in order that the
temper of the House might be tested by the
debate on the Tariff Commission Bill, which
will come up for discussion Tuesday of this
week. The action is not in any sense ad-
verse to the bill. Indeed, it is reported that
the Republicans on the committee are nearly,
if not quite, unanimous in their indorse-
ment of the principle of the bill. The action
was only a prudential measure. As this
bill comes to be understood, there is an
almost universal recognition of the justice of
the principle. The opposition to it comes
only from those whose interests might be
temporarily injured by having justice done
and having the true spirit of the tariff law
enforced. It will be impossible in the fu-
ture to pass any tariff act without the formal
embodiment of the McKinley principle in
that act. As a prominent steel manufacturer
aptly remarked: "The McKinley principle
must serve as the doxology of all future
tariff legislation." The service done by
Mr. McKinley to the whole manufacturing
interests of the country, in insisting upon
this principle receiving the formal sanction
of the statute law, cannot be overestimated,
and the gallant fight he has made and is still
making for his bill deserves the warmest
praise and gratitude of protectionists every-
where, and especially of the employers and
employed in the iron and steel trades.

The flood of immigration coming upon us
from the Old World surpasses the most extra-
vagant predictions. During the month of
February, one of the most tempestuous of
the year, there arrived 16,751, or 7000 in
excess of the corresponding month last year.

when the figures were pronounced without precedent. At this rate, what may we not expect in June, when the immigration season reaches its high!

The working classes in New York City are thriving, if we may judge from the condition of the savings banks, whose combined resources amount to \$443,000,000. Last year the deposits in this city alone increased \$18,000,000, which is more than half the total gain of all the savings banks of the State.

We present elsewhere a full report of the session of the American Institute of Mining Engineers in memory of Alexander L. Holley. Comment is unnecessary, as we can add nothing to the tributes of those who, with full hearts and tremulous voices, took part in its solemn and beautiful exercises.

A Deep Mine in Przibram, Bohemia.

"The Adalbert silver mine in Przibram (Bohemia) has now been excavated to a depth of 1032 meters, and is thus one of the deepest mines in the world. The heat at Przibram is so great that it is not possible to proceed further."

The above notice, which appeared in our columns some time since, calls for a correction which we have received from Prof. H. Hoefler, one of the editors of our esteemed contemporary the *Oesterreichische Zeitschrift für Berg- und Huettenwesen*. Professor Hoefler writes as follows:

PRZIBRAM, Feb. 4, 1882.

To the Editor of *The Iron Age*.—DEAR SIR: In your issue of November 3, 1881, it is stated the heat in the Adalbert silver mine, in Przibram, is so great that it is not possible to proceed further. Being an attentive reader of your highly-esteemed paper, I consider it my duty to correct this statement. At the greatest depth (some 1000 meters below the surface of the earth), the heat is anything but excessive, the temperature of the rock being 24.4° C., (75.9° F.), and the temperature of the atmosphere 24.6° C., (76.3° F.), so that the natural means of ventilation, heretofore employed fully suffice for all purposes. Very respectfully,

H. HOEFELER.

The Peter the Great.

The alterations made by Messrs. John Elder & Co., of Glasgow, Scotland, in the Russian man-of-war, *Peter the Great*, being now completed, the vessel was taken out of the dock January 21, during a high tide, and towed to Greenock, preparatory to taking in stores and undergoing her trials before leaving the Clyde. The *Peter the Great* arrived at Messrs. Elder's Fairfield Works on the 13th of July last, after a rather stormy passage round the north and west coasts of Scotland, and the alterations made in her have thus occupied fully six months. We gave a brief description of the vessel in a previous issue, and it is therefore unnecessary to dwell upon the details now. It may, however, be of interest to state briefly the nature of the work which has been done in connection with the vessel by Messrs. Elder & Co. The workmen of that firm were engaged from the 25th of July to the 13th of August in removing her old machinery and boilers, which consisted of three sets of engines and 12 boilers. This task being accomplished, the *Peter the Great* was towed up the harbor and placed in the Clyde Trustees' Graving Dock at Salterscroft on the 26th of August. Here very extensive repairs were executed upon her. Built of iron, she is sheathed with wood and covered with armor-plate to about 4 feet under water mark. In Salterscroft Dock the vessel was thoroughly calked and the wood sheathing coppered over. Two new propeller shafts were put in, two brass propellers and a brass rudder-post, and also two complete sets of gearing for working torpedoes and firing them under water. This part of the work was finished on the 8th of October, when the vessel was brought out of the graving dock and taken back to Messrs. Elder's dock at Fairfield, for the purpose of having her new machinery put in. While preparations were being made for this purpose it was discovered that the *Peter the Great* was not quite so strong a ship as had been believed, and it was found necessary to strengthen her considerably for the reception of machinery. This being done, the new machinery, consisting of six boilers and two sets of engines, *fac similes* of those placed on board the *Czar's yacht Livadia*, were put in. The engines indicate 8000 horse-power, and are expected to give a speed of about 12 knots. The boilers are designed for a working pressure of 75 pounds, whereas those taken out worked at 30 pounds when new, and considerably less when they arrived in the Clyde.

The report of the Society of German Iron and Steel Manufacturers gives interesting information concerning the output of German iron works during December, 1881. The total output amounted to 280,826 tons, and may be placed under the following heads:

| | Tons. |
|---|---------|
| Puddling pig..... | 158,927 |
| Spiegel pig..... | 19,304 |
| Bessemer pig..... | 64,151 |
| Foundry pig..... | 22,591 |
| Castings..... | 795 |
| Estimated production of works concerning which no definite information could be obtained..... | 22,000 |
| Total..... | 280,826 |

The output for December, 1880, amounted to 203,677 tons, and the total production of the year 1881 to 2,781,175 tons.

It is reported that the Venetian Society of Public Works has asked the government for authorization to make surveys for a project of railway communication between Sicily and the mainland, by means of a submarine tunnel under the Straits of Messina.

Last year the German wire mills supplied England with 30,000 tons of wire, and Russia with 40,000 tons. France received from Germany from 12,000 to 15,000 tons of steel wire for sofa springs, and America not less than 30,000 from the same source.

ALEXANDER LYMAN HOLLEY.

Memorial Session of the American Institute of Mining Engineers.

We give below a report of the session of the Institute of Mining Engineers, devoted to memorial addresses on the late A. L. Holley, held in Washington, February 22d. Mr. Wm. Metcalf, of Pittsburgh, called the meeting to order and spoke as follows:

MR. WILLIAM METCALF.

When the sad news of the event we today commemorate came to me over the wires, my first thought was that at our annual meeting we must have a memorial service. I instantly sat down and wrote to the secretary, suggesting this meeting. By the same mail, Dr. Raymond wrote to the secretary making the same suggestion; and by the next return mail the secretary wrote to me endorsing the suggestion. I feel that, owing to the very intimate connection of Dr. Raymond with the Institute, and the more than intimate relations that existed between him and our departed friend, it is only fitting and due to him that I should retire from the chair, and make this memorial meeting in truth and reality, and to call Dr. Raymond to the chair, as the one who properly and fittingly ought to preside, and I have arranged the meeting accordingly.

Gentlemen of the Institute, we are met today to pay the highest honor to our friend that earth can give. We are to lay bare our hearts, open the storehouse of memory, and bring to view, each in his own way, the pictures treasured there, of the rare merits of him who has painted them there. From the day when, in Pittsburgh, I first met Mr. Holley, till the last day I spent with him in June last, the impression left is one of almost uninterrupted sunshine. I always found him to pour out his knowledge without stint, and if he ever asked anything in return, he did it in such a way that it was felt that a great favor had been granted, only to find later that he had left behind more than he had taken away. He was a charged receiver. His mind was full, and when anything was dropped into it, it spilled always what at the time was of greater value. He was a gatherer and a scatterer. He gathered items and gave whole systems in return. He gathered flowers from every place, but handed to his friends bouquets of knowledge and artistic plants of rare beauty. He gathered for himself a few thousands, and scattered to his clients and friends throughout the world untold millions. He gathered all hearts into his own large heart, which shed its overflowing love on every one he met. He had a rare insight, and saw use and good where others saw only void or dust and smoke which their eyes could not penetrate. Perhaps the noblest of his acquirements was his full knowledge of the value and the steady use of the greatest forces known to man, and, above all, the steady exercise of the enduring, all-powerful, irresistible force of love. Beyond all these, his science, his wit, or his skill, his love for us is what makes us hold his memory so dear. His winning smile, sunny face and cordial greeting we all remember well; but how entirely they are all put into the shade by the memory of his quiet talks when the sweetness of his heart poured itself out as from a ceaseless spring. He was modest and did not seek his own preference. He was content to let others precede him. I wish I dare tell you he once averted a great estrangement of friends by going to each, humbling and making himself out the greater sinner; and how nicely his friends fell into the trap. We shall miss him indeed the next time the waters of strife arise. I have known him in some severe trials, and some of his disappointments as well as triumphs. I feel it a true thing to record of him: "His ways were ways of pleasantness and all his paths were peace."

Dr. R. W. Raymond was then called to the chair and spoke as follows:

DR. RAYMOND.

My friends—for friends indeed we are, and drawn more closely together at this moment in the sympathy of mutual grief—what can I say; what can any one say, in these first days of the paralysis of bereavement, except to ring the changes on the two themes, love and loss? He was so much to us; we miss him so sorely! A meeting, and no paper from Holley; a banquet, and no speech from Holley; a cordial reunion of fraternal joy, and no smile or hand-clasp from Holley; it is more than sad, it is bewildering. We stand as those before whom the earth suddenly opening has swallowed up the place where their affections and their occupations alike centered, and who know not whither to turn. A man is not necessarily missed in proportion as he is loved. He is missed in proportion to the number of points at which he entered into our lives, and the emphasis with which he impressed his being upon ours at each point.

Mr. Holley entered the Institute in November, 1871, the first year of its existence. He brought to it a reputation already assured, a wide acquaintance and an intense enthusiasm. He devoted to it from that hour his unexampled gifts, in a spirit of absolute self-abnegation. After serving as vice-president, he accepted with joy and pride the unsought nomination and election to the presidency, because he felt that it was in his power to increase the sphere of the influence of the Institute, and enlarge its sources of power. At the end of a year he declined a re-election, resisting all solicitations to continue what had unquestionably been a most brilliant and successful administration, because he felt—what no one else felt—that in the Centennial year, we should be represented by some one better prepared to receive and entertain foreign guests. He worked harder to get out of the presidency than many men would work to obtain public honors. Who among us can remember any movement for the advancement of the interest and profit of our members, in which he was not active? Who is not personally indebted to him for something that will be a precious memory hereafter? These debts we cannot pay; but we can at least acknowledge them. For my part, among all the services which I have attempted to render to the Institute, the one

upon which I look with the greatest satisfaction is, that it was my good fortune to overcome the modest reluctance of Mr. Holley, and induce him to enter upon that prominent activity in our affairs for which he was so brilliantly qualified, and which he so fruitfully pursued. It seems strange to recall that when I knew him first, fourteen or fifteen years ago, he was afraid to speak in public—he, by whose eloquence and humor we have been charmed so many times since! He was not wont to parade his accomplishments. I remember how, in 1873, I first discovered, after years of acquaintance with him, his knowledge of architecture and his skill as an artist. It was after one of the sessions of our Eastern meeting in 1873, and he was waiting for some of us who were detained in a committee meeting. It was in my lecture room at Lafayette College; and the blackboard stood invitingly empty. Seizing the chalk, Holley employed the five minutes of idleness in an incredibly rapid and apparently careless scratching upon the board, and when we came from the committee meeting, lo! there stood before us a magnificent gothic cathedral, arch, buttress and spire complete, recalling, though not precisely repeating, the white glory of Milan, or the stately splendor of York. In all that hasty work, not a line had been thrown away; not an essential detail had been omitted. I love to think of the incident as a type of all his work—the clear creative conception, the trained skill of execution, the art become a second nature, the intuitive use of means to ends, that shone through it all.

It is by reason of his many-sided activity that it has seemed best to make this meeting a multi-voiced testimony to him. No single minstrel—only a great chorus—can fitly chant his praise.

DR. T. STERRY HUNT.

I feel how utterly inadequate words are to express my feelings, and I am sure you are all equally aware of the position in which I find myself placed, when I try to express as well as may be our appreciation of the many virtues and rare and precious qualities of our friend Holley. I can only recall a few of the facts of our intercourse with him, which may justify me, to some extent, in feeling as I do.

Our acquaintance began fourteen years ago. Probably few here have known him so long. In 1868, when the firm of Winslow, Griswold & Holley were upon a work in which his fame and usefulness were hereafter to be so conspicuous, as a student in metallurgy I was a frequent visitor to and guest of Mr. Holley. Afterward, in 1870 or '71, I was his companion in metallurgical investigation for something like a week, in Pennsylvania, New York and Ohio, studying the rolling mills and various other establishments where he was able to bring his special knowledge to bear for my instruction and that of his other companions—one of whom is here to-day. In 1876 I was again, most fortunately, intimately connected with him as one of the judges at the Centennial Exposition, day after day and week after week, in the metallurgical and machinery departments. I never shall forget the pleasure I felt when, in 1878, I chanced to find myself in Paris at the meeting of the British Iron and Steel Institute. There were present three Americans—Mr. Holley, Mr. John Fritz and myself. At the grand banquet which was given to the Institute Mr. Holley was chosen to speak for the American people and the American Institute of Mining and Engineering. I have heard him often, and we all remember his eloquence, but those who did not hear him there never heard him at his greatest and grandest. I never had my heart swell with pride as at that time, when Holley arose and made a brief speech in reply to the toast of "The Engineers of the United States." As a member of the Institute, and as a Connecticut man, I was proud to claim Alexander Holley as a representative American in the highest and best sense of the term—representing American manhood, American science, American technical skill, and American eloquence and genius as well.

One more memorial of Holley, and the last. It was my fortune, about the 5th of last November, to learn that he was lying ill at the London Hotel. I hastened at once to see him, but was met by the joyful intelligence that he was better, so that he had gone out. I had started to return to my hotel when I met him coming up the stairs. His light and joyous footstep, and his bright, beaming countenance, like that which looks down to us from the picture which we see before us, I shall never forget; nor the hearty grasp of greeting which he gave me, the interest with which he listened to my account of my travels over various parts of Europe, and the pleasure he manifested at my return. He was to leave the next day for the North of England, and to join his family in a few weeks. I expressed my regrets that I had not been at the previous meeting of the Mining Engineers, and he said that we would both meet at the session in February next. Alas! you all know the story, and I feel that I cannot say another word. My heart is too full. I can only say that silence seems to me the best proof of our sorrow.

HON. ABRAM S. HEWITT.

Mr. President, Ladies and Gentlemen: I come with no set forms of speech to speak of our departed friend. In fact, I did not know that I was to speak on this occasion. But for one who knew Mr. Holley as I knew him to remain silent in the midst of such a loss, is more than heart would tolerate. I do not know who in this audience first had the honor and advantage of his acquaintance. My own memory goes back somewhere between twenty-five and thirty years. He came into my office. I do not remember whether he brought me a letter of introduction, or whether he introduced himself, but I never have forgotten, and I never will forget, the wonderful impression which that boyish face made upon me; the look of intelligence, of honesty, of calm consciousness of power, was more marked in his face than in that of any young man who had ever come under my eye. At that time I think he was engaged in some literary work with Mr. Colburn. It was my interest in him which induced me to present him to my old friend, Edwin A. Stevens, who was one of the iron-

workers of that day who understood the laws of nature and the laws of personal character and motives. He made no mistakes among the men whom he chose to do his work. Under his patronage Mr. Holley made his first visit to Europe, and in all his subsequent career he enjoyed the friendship of Mr. Stevens and of the engineers who there first came into connection with him. I think I first called his attention to the Bessemer process. I mentioned the importance of its introduction into this country. My firm made a feeble effort within six weeks after the famous Cheltenham paper was read (1856) to see whether pig iron could be thus converted into steel. It was four years, perhaps, after that when he went to Europe and made his investigation, and brought back to his friends the control of that process. You know his contribution to the successful introduction and application of this wonderful civilizing agency.

Men are to be estimated by the standard of personal character—such as we know each other to be by personal contact. Those of you who enjoyed his friendship need no words of mine, nor of any one else, to elevate the standard of judgment which you have advanced for Mr. Holley. There is but one other estimate by which we are to judge men when they have passed away, and that is by the influence that they left upon the progress of civilization and the advancement of humanity. Of all men at this day in this line, I know of no one who has contributed so much to the growth of material wealth and the advancement of industrial progress in this country as Alexander Lyman Holley. I look upon the invention of Mr. Bessemer as the highest, the greatest invention of the age. I do not mean as measured by chemical or mechanical attributes; I mean by its great results upon the social structure of government. It is the great enemy of privilege, it is the great destroyer of monopoly, it will be the great equalizer of wealth. I have no time to pursue that line of thought longer, but those who have studied its effect upon the transportation problem, the cheapening of food, the destruction of aristocratic power upon the other side of the Atlantic, will readily comprehend my idea of its great influence. To these results, second only to those brought about by Mr. Bessemer himself, the contribution of Mr. Holley is greater than that of any other man. It is said that the world knows little of its greatest men, and it is true. The man who, in his closet, in the recesses of his own workshop, discovers a new law of nature, or a new process by which society is bettered, modified or revolutionized, is little known in his own day, and often it requires the historian in after days to properly estimate the contribution of such a man to the age. Happily, in this day of rapid communication we know better the work which has been done by such men as Holley. I think even now, so soon after his departure, we can assign him to the place which he will hereafter occupy in the history of American industry—a mechanical engineer of unerring judgment, a promoter of practical results, a lover of his race, he subordinated his genius, his talents, to the good of his fellow men. Alexander Lyman Holley will live in the memory of those who know him, and in grateful recollection of those who come after us in the years and ages of the future.

MR. WM. P. SHINN.

Mr. President, Ladies and Gentlemen: It is fitting that I should bear my tribute to the memory of our departed friend on this occasion, not only because of my having been a president of this Institute, but because it was through Mr. Holley that I became a member of it. It was at his suggestion that I made application; it was upon his recommendation that the council approved my application, and I more than suspect that it was through his kind offices that I was nominated to the position of president of the Institute.

It is now more than twenty years since I first came in contact with the professional labors of the late Alexander L. Holley in his publication, with old Zerah Colburn, of the report on European railroads. Engaged as I was then, the report was of great importance, and amounted almost to a revelation. Many of the appliances which are now so familiar to us were unheard of then. The fish-joint had not yet been adopted, and many officials first heard of it in Holley and Colburn's report.

My first association with Mr. Holley began with the ground plans for the Edgar Thomson Steel Works in 1873; and what surprised me most was to find that the Holley of the European report was still a young man, although since then he had become the acknowledged authority on Bessemer steel manufacture, and had meanwhile published a report on ordnance, also accepted as a standard work. I never knew which to admire most, the versatility of his genius, the depth of his professional knowledge or that genial disposition and quickness of perception which made personal intercourse with him a pleasure, whether the object to be attained was strictly of a business nature, or merely social pastime. He appropriated and imparted information with equal facility and apparent gratification, and in the amenities of private and social life he was as happy as in his professional life; he was thorough. Not only to those who knew him best will he remain an ever-present memory, but to all who met him, particularly with the engineering societies, of which he was the life. His death has left a void which time will efface but slowly. Those who heard the ineffable tenderness with which he responded to the presentation address which, by the partiality of his friends, I was deputed to make at the Pittsburgh convention, in 1879, will never forget that eloquent apostrophe to death which he, of all those then present, has been the first to experience.

ASHBEL WELCH.

About a quarter of a century ago there was a young man who had already attained eminence as an author. He was highly educated and highly accomplished in every way, but with a red shirt with sleeves rolled up, and hands all smirched, ran a locomotive on the Camden and Amboy Railroad. Such a prodigy attracted my attention. I found that he was studying to be an expert in steam engineer-

ing; that he was not content to take his knowledge from books, but that he wanted to see everything, and on the railroad he took the best way of getting at it by going into it. That man, as you will all recognize, was the man whose portrait you see yonder. Now, I want to say—if there are any educators here, and I am sure there are—I want you to say to your students, do not be afraid of smirching your hands; do not be afraid of dirtying your fingers; if you want to learn mechanical engineering or steam engineering, do as Holley did. Twenty years ago there was lying at Hoboken what was called the Stevens battery. It had been made many years before for the purpose of defending the harbor of New York. It was adapted to that purpose, and to no other purpose. The designer of it never thought of any other purpose, but the changes in events had made it unnecessary for that purpose. The Stevens battery, as you all know, was the father of ironclads, or rather of proposed ironclads. The then proprietor of the ship was desirous of adapting it to sea-going purposes. He had had years previously a good deal of experience in firing large shots, a thing never brought to this country in armored ordnance. I was called in, and Mr. Holley was called in, and we worked together for some months to see what we could do there. It was my good fortune to inform Mr. Holley of a great many of the experiments that had been previously made, and he saw some of those made at the time. And that was the seed sown in his mind which afterward grew up into his great book on the armorial ordnance. I can endorse all that has been said, or all that can be said, of his genial, lovely disposition. I am almost tempted to mention one incident, yet I cannot describe it. We were here together, at Washington, when he got word from home that his oldest daughter was born; and I remember the beams of parental love then disclosed. Mr. Holley was one of the most wonderful men that I have ever known, in character and capacity. A single word dropped in his ear, a single little seed sown, was sure to grow up into a powerful plant, a great tree, just as the little suggestion at Hoboken grew up into his book on armorial ordnance. I am sorry that I did not know I was to be called upon, or I might have said something more fitting to the subject.

E. D. LEAVITT, JR.

Mr. President, Ladies and Gentlemen: I first met Mr. Holley in 1859. He was then a young man, who seemed to me the finest looking I had ever seen. He impressed me, as Mr. Hewitt said he did him, with his force of character as a man who would carry through anything that he undertook, and I claim that he was such a man. I had been connected for several years previously with the establishment to which Mr. Holley went first on leaving Brown University, and the traditions of his ability, of what might be called his budding genius, are still there. I remember what an impression it made upon us, notwithstanding the feeling that working mechanics had for a man who was just out of college. We all know that such men are not generally regarded with much favor, and it was then more so than now. But Holley had impressed these men as an honest worker for truth—ready to roll up his sleeves and do anything that any of them would do. He would never shirk any duty, however menial. I again met him in 1876, when he invited me to join this Institute. Through his kind offices it was, I merely granting permission for the use of my name, that I became a member; and I have been more or less intimate with him ever since. When the Society of Mechanical Engineers was formed, Holley was the moving spirit. He presided at our first meeting. I was a member of the Nominating Committee for the first board of officers, and to illustrate his extreme modesty, which impressed me very strongly at the time, I remember with what great difficulty we persuaded him to resign from our committee, in order that we might make him an officer of the society. We found it was absolutely indispensable to have him in a prominent capacity if the society was to succeed. He was the most enthusiastic and energetic member, doing more for us than any other two or half dozen men, from the fact that he was so well acquainted with the leading engineers throughout the country. When the wire flashed to me the information of his death, I felt at once an overpowering sense of loss. I was about leaving home, and it seemed like going away from a death-bed in my own household. All through the night it came to me—what a loss! And I cannot express fitly and fully the feeling which dwells with me at this time, at the loss we have met with in the decease of our dear friend.

CAPT. C. E. DUTTON.

It is a gratification to me to be able to unite with yours my testimony of love and affection. It was my great privilege to be very intimate with Mr. Holley at a period of his career which was, perhaps, the most interesting. We all know how broad a man he was, how wide a field of mechanical art his attainments covered, how splendid was his culture in all respects. But we know him best, perhaps, through his relations to the Bessemer process—that great epic or drama of the modern arts. And in that epic we will all concede that he played the part of Achilles or Aeneas. When I knew him most intimately and was most closely associated with him, the Bessemer process was in its dark days. Those who are familiar with the history of the early development of that process, cannot fail to recall the vast multiplicity of difficulties which stood in the way of the development of its details—how they rose up on every hand, how they met the engineer at every step and in every turn of the arts. The art had no precedents whatever. Everything connected with it had to be created anew. It was in this stage of the process that it seemed to me that Holley showed the noblest and strongest traits of his character, both intellectual and moral. I think that Holley was undoubtedly the first to take a broad view of the policy of a Bessemer establishment, which subsequent experience has proved to be a correct one. He knew at that time, although he was perhaps unable to demonstrate it—still he knew, and constantly asserted, that it was necessary for all purposes to take a wider range and



Excelsior Lawn Mowers

Received Highest Award at the Centennial Exposition.

Features for the Season
of 1882.

Lightest in Weight.
Lightest in Draft.
Simplest in Construction.
Most Durable.
And the BEST.

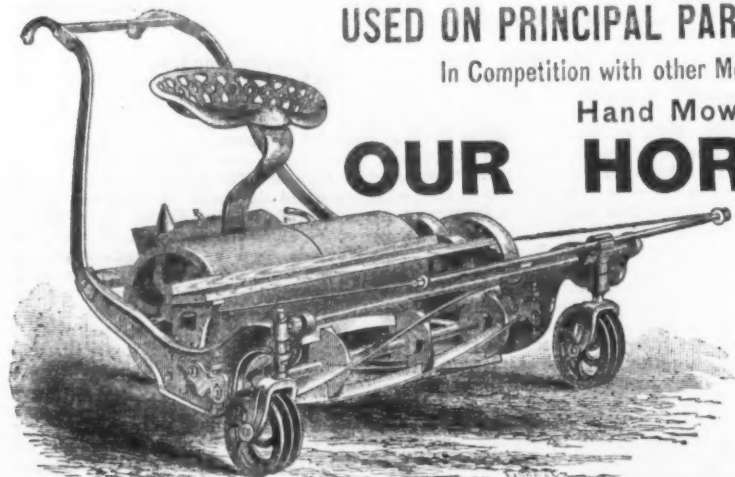


USED ON PRINCIPAL PARKS OF EUROPE AND AMERICA.

In Competition with other Mowers has always carried off the Prize.

Hand Mowers 8 to 20 Inch.

OUR HORSE MOWER



IS CONCEDED BY ALL TO BE
THE BEST ONE MADE.
SIZES 25 TO 40 INCH.

All our Mowers are fully Warranted. A trial is Solicited.

Full Directions for Setting-up, Adjusting and using accompany each Mower.

For Catalogues and Prices, address

CHADBORN & COLDWELL MANUF'G CO.,
NEWBURGH, N. Y., U. S. A.



NEW AMERICAN FILE COMPANY

PAWTUCKET, R. I.,

MANUFACTURERS OF

FILES AND RASPS.

ESTABLISHED 1863.

Capacity 1000 dozen per day.

GOODS WARRANTED TO GIVE SATISFACTION.



WITH PATENT ADJUSTABLE ATTACHMENT. The only Saw that can be adjusted for either a One-Man or a Two-Man Saw. We make the following lengths, 3½, 4, 4½, 5 feet. Send for sample.

WHEELER, MADDEN & CLEMSON MFG. CO., Middletown, N. Y.

HARVEY W. PEACE, VULCAN SAW WORKS, Brooklyn, E. D., N. Y.

Manufacturer of First Quality.

Hand, Panel, and Rip Saws,

AND KINDRED GOODS.

Also, MILL, CROSS-CUT AND CIRCULAR SAWS.

BAND SAWS

A SPECIALTY.



M. D. SHIPMAN.

S. M. STEVENS.

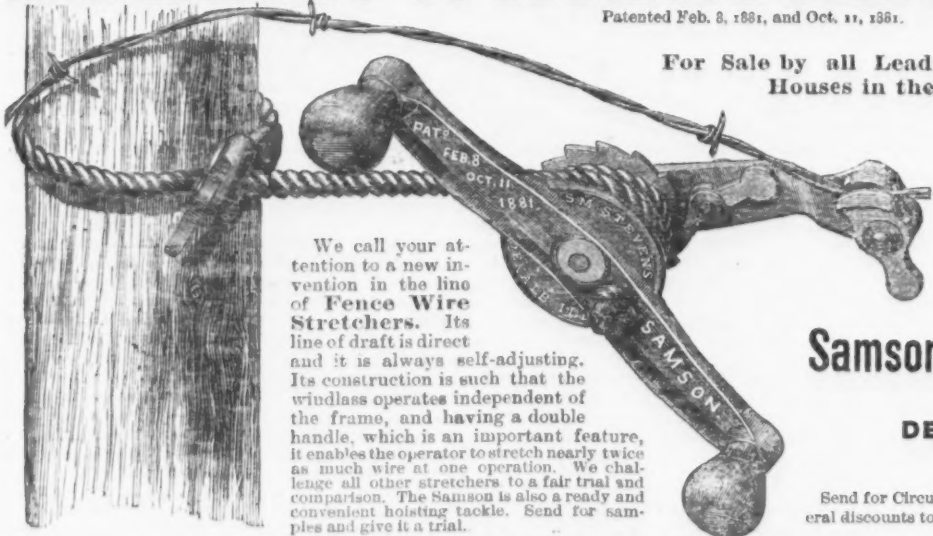
C. E. BRADT.

S. E. BRADT.

SAMSON WIRE STRETCHER

Patented Feb. 8, 1881, and Oct. 11, 1881.

For Sale by all Leading Jobbing Hardware Houses in the United States.



MANUFACTURED BY

Samson Novelty Works,

DE KALB, ILLS.

Send for Circulars and Price List, showing our liberal discounts to the Wholesale trade.

NEWTON'S PATENT STEAM TRAP AND GRATE BARS,

MANUFACTURED BY

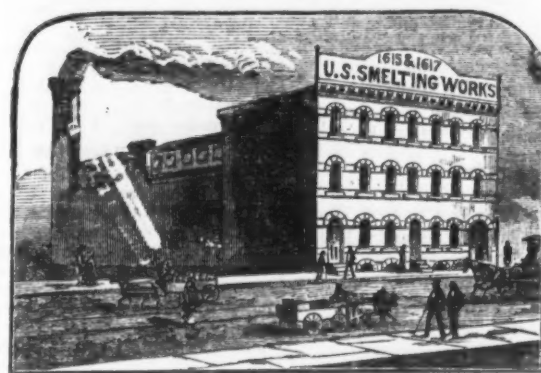
PROVIDENCE STEAM TRAP CO., Providence, R. I.

See The Iron Age first issue of each month.

Agents Wanted for Different Locations.

UNITED STATES SMELTING WORKS,

MANUFACTURERS OF



Babbitt Type and Bolster Metals.

BRASS CASTINGS, CAR BEARINGS and SOLDER

OF ALL KINDS.

Pig Brass, Bar Tin and Lead, and Spelter.

IMPORTERS AND DEALERS IN

PIG TIN, PIG LEAD, PIG COPPER,

ANTIMONY, &c.

1615 & 1617 Spring Garden St., - - PHILADELPHIA.

AMERICAN SAW CO.

TRENTON, N. J.

HOLLOW BACK CROSS CUTS.

Patented Nov. 12th, 1878. Re-issued April 12th, 1881.



ONE-MAN SAW.

With Reversible Handle.



THE EAGLE LOCK CO.,

TERRYVILLE, CONN.,

MADE



(No. 4005.)

THE ONLY PIN-TUMBLER PAD LOCK EVER PRODUCED.

It is self-locking and perfectly secure. It is made of brass and finished by our patented process. The above cut represents the only size yet made, but other sizes will be furnished as soon as the requirements of the trade are known.

For Sale by Hardware Jobbers Throughout the Country.

BEECHER & PECK,

Successors to Milo Peck, Manufacturers of



PECK'S DROP LIFTER is the only one which has its parts cushioned. Being thus cushioned they are the most durable Lifter in the market.

Can be attached to any drop now in use.

Send for Illustrated Catalogue.*

Cor. Lloyd and River Sts.,

New Haven, Conn.

Stanley Rule & Level Co.,

MANUFACTURERS OF

Improved
Carpenters'
Tools.



FACTORIES

New Britain, Conn.

WAREHOUSES,

29 Chambers St.,

New York.

Manufacturers of Bailey's Patent Adjustable Planes.
General Agents for the sale of Leonard Bailey & Co.'s "Victor Planes."
Manufacturers of "DeLancey" Patent Adjustable Planes.

involve larger amounts of capital than anybody at that time thought necessary. Men persisted in dependence upon the converter. They said that if they could only manufacture ingots they could sell them; that it was a patented process, and on that everything rested. But from the very start Holley was convinced that the Bessemer process always meant blast furnaces, blooming mills and rolling mills. He was unable for a long time to engage in any Bessemer enterprise in which he could carry out his own ideas to his satisfaction. Perhaps it was not in the long run unfortunate that it was so, for there were matters of detail to be overcome which even he could not have foreseen. It was from the period of 1866 to 1869 that those great difficulties presented themselves most numerous and were battled with most successfully. There was many and many a time when Holley became almost discouraged; his whole soul was wrapped up in that great enterprise, for which he seemed to live. Everything else for the time being was thrown away, and as disappointment after disappointment came over him he would frequently break out to me, in moments of confidence, in a feeling almost bordering upon despair. Probably very few of those who knew Holley can associate him with any such frame of mind. To almost all of us the recollection presented to us is that of a man of extremely cheerful, warm, genial disposition—a man whose temper would more probably lack sufficient hardness of edge to stand the blows of severe trial and adversity. But it was not so. No man ever showed truer temper under trials and difficulties than he. No man was ever more fully persuaded of the difficulty of his task than he was, or ever brought to bear more expedients and struggle with more courage and more vigilance. It was in this stage of his career that I knew him best and was associated with him most closely. I felt his troubles as if they were my own, for I think I was at that time almost the only person with whom he associated upon terms of extreme intimacy outside of his own family. But when his success came, no person ever rejoiced with him more heartily than I did. I am very glad to speak of this portion of his life and career, because I presume that very few people knew of it as well as I did; and if anything could add to the strong love and affection we bear for him, it is perhaps the conviction that he, too, had trials which were bitter to suffer, and that he surmounted them and conquered like a true hero.

MR. ROBERT W. HUNT.

Mr. President and Fellow Members: Had our dear friend and brother been asked to select the tribute most grateful to him, I feel certain he would have desired it to be paid by the American Institute of Mining Engineers. Feeling this, I am glad to add my mite to the expression of grief and respect we are paying his memory to-day, and which will be but an echo of that already gone up from all over our own country, and which will re-echo from abroad when we receive tidings of their reception of the sad news. I first met Holley in the fall of 1865. He was then a member of the firm of Winslow, Griswold & Holley, and manager of their Bessemer works at Troy. Those works then consisted of the 2½-ton experimental plant, which he built on his return from England in 1864, after having purchased for his firm Bessemer's American patents.

In the light of the present Bessemer practice, it seems like a dream to look back to that time, and a full realization of the difficulties encountered and overcome can only be realized by the men who came through those early days. Our imperfect knowledge of the chemical requirements of the process, our utter absence of tested and approved refractory materials, and above all, an imperfect machinery, were the conditions of the problem which, in 1864, Holley set himself to solve. With his own hands he had to make his first tuyeres, mold his first stoppers, and line his converters and ladles. When meeting with failure after failure, through the imperfection of some of the materials employed, or the breaking down of some of the machinery, he not only maintained his own high courage and confidence in ultimate success, but kept up as well the doubting faith of those associated with him. Encountering these troubles, his ever-active mind and wonderful inventive genius at once grasped the mechanical difficulties, and, as a result, gave us the present American Bessemer plant. These mechanical departures he patented, and in the final settlement of his firm's relation, these patents became the property of his partners, and subsequently of the Bessemer Steel Co. The Bessemer patents having expired, Holley's are now the only ones on which this company can collect royalties. One of the first monuments to his ability as an engineer exists in the only Bessemer plant yet built in this country outside of his patents. I think my fellow Bessemer managers will unite with me in ranking it far below the standard of a Holley plant. It is very good indeed, but, compelled to avoid him, they also avoided much that was good. In the criticism of these his lovable nature was shown. I am certain to no one sooner than myself would he have freely expressed his opinion, but never did I hear him utter an unkind or slighting word about this, if I may so call it, rival plant. So many of its owners were his friends (as who was not?), I suspect many a hint was given by him of danger to be avoided.

After leaving Troy, upon the dissolution of the firm of Winslow, Griswold & Holley, he assumed charge of the completion of the Harrisburgh Works. At this time began our closer acquaintance, ripening into warmest friendship. We at Cambria rolled the steel made by him at Harrisburgh. This brought George Fritz and Holley together, and a most intimate relation it became. I regard these two men as having been among the most brilliant metallurgical engineers the world has yet seen. Entirely unlike in all save genius and heart, they became mutually helping, utterly trusting friends. George Fritz was a rugged, self-educated, self-made man, naturally jealous and distrustful of assumed scientific knowledge, but Holley, with all his science, his culture and polish, won to himself this man of iron. I know George Fritz loved him as with the love of a

woman. A few short years ago we buried him. His labor over, his enduring monument left in his work, and over his grave stood no more sincere mourner, no more stricken heart, than Alexander Holley. And he also is at rest with a monument of imperishable work even greater than his friend. Their country, the world, gainers by their lives; now, alas! their reward attained all too soon. During those Harrisburgh days, Holley encountered many difficulties, many trials. Even his brave spirit was often almost daunted. When having made the works a success for that period, I think he was glad to accept the offer of John A. Griswold, for whom he entertained the greatest affection, to again assume control of the Troy Works. Mr. Griswold, himself a most captivating man, fully appreciated Holley, and their intercourse was entirely satisfactory. But the field of one establishment was too small for his restless genius, so in 1871 he relinquished the management and became the consulting engineer to several of the works then built, or in course of construction. Hence it came that he was connected with the construction of all the eleven works of the Bessemer Company save two. While ever loyal to the Bessemer process, Holley early became interested in the Siemens-Martin method, and devoted much time to its study and in making out the details of the plant. Here, as in the Bessemer, he at once cut loose from the accepted practice, at least partially. As a result of his professional advice, the first open-hearth works built with him as consulting engineer are the finest in this country, if not for their size in the world. He was a firm believer in the Perrot furnace, and the results now being attained in the plants built under his advice certainly point toward his belief having been well founded. After full investigation in Europe he became fully impressed with the merits of the basic process, and mainly through his exertions were the Thomas-Gilchrist patents purchased by the Bessemer Steel Company. In this connection came his last triumph as an engineer. While there is not a doubt about the chemical success of the basic process, still, from an American steelmaker's standpoint, it would not pay without some such invention as Holley gave us in his removable shell. We must have speed. Slow work may answer abroad, and even pay better than fast, but not so here. Of Americans Holley was most American, and I regard his last invention in its boldness, in its simplicity of detail, in its entire practicability, as a fitting crown to his illustrious career.

We have spoken of Holley, the engineer. As such the world mourns his loss, but we weep for Holley, the genial companion, the brilliant wit, the sympathizing friend, the noble man. His sympathy was always ready. His heart was for his fellow-man. Probably no man had his good offices more abused, but he never sored, and even had an excuse for the delinquent. Some eighteen months ago his friends waited with fear the tidings of his dangerous illness while abroad, and as you will remember, at our last Philadelphia meeting one of our members so beautifully referred to our then late fears and expressed our thankfulness for his safe return. Alas! even then, while we were toasting his safety, the hand of death was upon him. The grim monster smiling mockingly at our human hopes. But when this presence was known to him, he met it as he had lived, with quiet self-possession and thoughtfulness for others, with a brave undaunted spirit. Shall I, while thinking of greater, speak of my personal loss? Associated with him as I was for fifteen years, he had become part of my professional life. Alexander Holley was my closest, dearest friend. I loved him as my own brother. The void is unrealizable. But the world rolls on. Our daily duties, difficulties, trials present themselves, can we do better than meet them? Can we not be better men from having known and loved that spirit who did more than his duty, who surmounted all difficulties, who shrank from no trial? Our hearts are stricken, but in our grief we rejoice that we knew and loved him who has so early left us for his rest.

Hon. A. S. Hewitt, taking the floor a second time, said: "I beg pardon for interrupting, but I shall be condemned by all of you if I do not relate an incident that happened in London at the time Holley was sick. Reference has been made to the movable shell, his patent, which, as I understand, is necessary to the success of the basic process in America. While in Europe in 1880, in the fall of the year, I was astonished and pained to hear that Holley was dying in London. I immediately went to Clapham, where he was said to be, to see whether he could speak to me. I was shown into his room, but before I went up, the attending physician, who had just left him, met me at the foot of the stairs, and said his death was a question only of hours, or at most only of three or four days. Three consulting physicians had arrived at the same conclusion; and I was so sure that his death was imminent that I afterward wrote home to advise a friend to prepare his family for the sad result. I went into his room and found him the very picture of dissolution. He smiled his old smile, and after a few words had passed and, I suppose, seeing upon my face the expression of profound sympathy, he said: 'Well, I suppose they have told you that I am going to die, and I suppose I am, although I mean to get home first if I can; but,' said he, 'I have been trying to amuse myself while I am dying by inventing something that will enable me to die with credit. I want to make the basic process practicable, and I have just perfected here upon my bed the details of the movable shell; and if I don't live long enough myself to introduce it, I have explained it in full to my assistant, so that this invention shall be known to my countrymen.' His recovering as he did, rising, as by a miracle, from that deathbed, only adds to this remarkable evidence of the extraordinary vitality and energy which characterized him, and which surpassed that of any man I ever knew."

DR. THOS. EGGLESTON.

Mr. Chairman: There are some men who impress themselves so thoroughly upon our lives that it is impossible to tell when we first became acquainted with them. I have

been trying ever since the Monday morning when I saw his death announced, to tell when it was that I first met Holley. I do not know. It seems as if I must have known him always. I have looked forward month after month, week after week, for so many years to meeting him, waiting to hear his cheerful greeting, to learn something of the progress of his work, or to have some word of encouragement when I was discouraged in my own, that it is almost impossible to say when I first met him. There is a side of his character that I know perhaps better than any of you. Probably some of you may remember the stand that Holley took in the Philadelphia meeting of 1876, during the discussion upon technical education. He said those of us who were engineers, who design and who build works, are in duty bound, when called upon, to teach those who come after us upon what principles it is done. The work of teaching should be one of just as much conscientious endeavor as is the prosecution of the professional work we are doing. It did not strike me at the time as being a thought which is so pregnant as it really is, but I learned its meaning when I heard him lecture a few months after this speech was made. Holley was called by the trustees of the Columbia College to lecture at the School of Mines on the manufacture of iron and steel. I took it for granted that on account of his professional engagements he would refuse. The reply he made to me was, "It is my duty if I am called upon to lecture upon iron and steel to do so. I cannot make my arrangements to do it this year, but I will do it next," and he did so for several years, as a matter of principle, and at great personal inconvenience. There are some here who have heard Holley lecture to young men, but there are only a few of us who have had the privilege. It was my privilege to attend nearly all of his lectures. How earnestly he talked to young men about how scientific and engineering work should be done. I don't think I ever heard such lectures. They were full of the practice and experience of a great engineer. He criticized freely the work of others, and did not forget to blame himself when any of his own practice had been wrong. I have heard him speak in the meetings of the Institute and say brilliant things, but I do not think I have ever heard such lectures upon metallurgical engineering. I used to remonstrate with him about his excessive, and what I thought, his unnecessary labor. "Yes," he would reply, "I know I am burning the candle at both ends, but I must be here to-day and be in Pittsburgh, Chicago or St. Louis to meet engagements and back here again to lecture. I cannot do otherwise." I said to him: "Holley, in justice to yourself, in justice to your friends, in justice to your profession, you ought to stop." He said: "I am going to stop. I shall not always work so hard, but I cannot stop now." He wrote over every word of every lecture he delivered. I urged upon him: "You are doing for the young men what young men do not appreciate." His lectures were worthy of an audience of engineers, and I expostulated with him for doing for young men what they did not and could not appreciate. His reply to me was the reply of a man who was thoroughly satisfied that he was right, and who was fully convinced that it was due to his profession that he should magnify his position as a teacher. "I cannot," said he, "afford not to write what I am to say, for I am in duty bound not to be too profuse when I am teaching young men the science of metallurgical engineering." I told him that I thought that young men would understand his own work better when presented to them in the more familiar form of an extemporaneous lecture, and just as he used to talk to us when every one felt it a privilege to listen. "But," said he, "I am enunciating principles to be remembered. It is my business, my duty, my pleasure to put them down, with my best thoughts, in the best language and in the fewest words that I possibly can." After hearing these same lectures twice, I urged him to write a book. "Some time," he said, "I am going to write a book on Bessemer practice. I cannot now, for I have too much work to do, and am burning the candle at both ends already, but some time I am going to write a book." The book is nearly written. The lectures were a book, and I hope some day some one will have the privilege of editing those lectures that he delivered at the School of Mines, and add to it the plans of the works he built and the practice he adopted, as the best tribute to his memory, because I do not think that any such discussion of steel metallurgical practice exists in print. Perhaps, if there is any satisfaction at all in thinking of Holley as a man that has gone from us forever, it is in thinking of the fact that not one stroke of his overwork hastened his departure. We feel almost called upon to regret that he did not do more work, for he was bound to die; death struck him months before, and of all the brilliant work that he ever did, the most brilliant was what he accomplished in the last two or three years of his life when, no matter what he had done, he could not have been saved.

G. W. MAYNARD.

I made the acquaintance of Mr. Holley in 1869, at Troy, while he was rebuilding the Bessemer works of John A. Griswold & Co. The introduction was at the table of our mutual friend, Captain Dutton. The charm of that first meeting can never be effaced. From that evening dates a friendship which intensified as the years rolled on. The magnetic influence of the man has been experienced by many, and I believe you will agree with me that friendship often ripens into affection. It would be difficult to say in what quality Holley especially excelled, for he was excellent in all; there was one, however, which he possessed in a marked degree, and that was always doing whatever he promised to do, particularly if the doing meant the granting of a favor. Perhaps this is not to be wondered at, for the substratum of his character was truth, and this was undoubtedly the mainspring of his influence with his fellow-men. Another trait was his good nature and the wonderful pluck which never deserted him in the most trying times, whether the trial was a lot of bad steel or personal physical suffering. On one occasion, when he was looking into

a cupola tuyere, an explosion of gas blew hot coals and cinders into his eyes, and for a time it was thought that he had lost his sight. On learning of the accident I rushed over to his room. I found him in great pain; still the joke was uppermost, when he said: "I'm glad you have come, for I wanted a mining engineer to work this newly-discovered coal bed." As an illustration of the absolute reliance reposed in him, I hope I will not at this late day betray confidence when I cite the words of his friend, Mr. Griswold, who sent for Mr. Holley one evening, for the purpose of discussing the chances of success of the Bessemer process. The gist of the conference, which extended into the small hours of the night, was: "Aleck, how much more do you want to pull us through?" "About \$100,000." "Go ahead, my boy; my faith in you is unshaken; I'll find the money." There were many characteristics which these two men possessed in common, and it may be said of our dear brother as it was said by a prominent citizen of Troy of Mr. Griswold at the time of his death—he was always a gentle man.

From 1873-79 I made several trips with him to steel works in England and on the Continent. The doors of works were thrown open to him as to no other man. His suavity and the fact that he always gave more information than he received, accounted for the exceptional facilities afforded him. His capacity for work was something remarkable, and as you all know, he had a world-wide reputation at an age when the majority of engineers have not yet got through with their preliminary training. Up to the time of the Philadelphia Exhibition he still appeared very youthful. On one occasion in London, in 1874, we casually met a prominent engineer to whom I introduced Mr. Holley. "Ah! any relation to Mr. Holley the engineer?" "He is the engineer!" "But not the great Holley who wrote that very thick book on ordnance and armor?" "Yes, he's the man!" "Ah, but that can't be, you know, for the man I mean must be about sixty years old." I am glad of the opportunity of paying this poor tribute to the memory of my friend, and the friend and brother of us all.

MR. T. C. CLARK.

Mr. Chairman, Ladies and Gentlemen: Holley was such a many-sided character that it is difficult to know which to speak of. What one omits to say of him the next one can say. I will, therefore, be very brief. Some thirty years ago certain worthy gentlemen, realizing the horrors of impending war, took it upon themselves to call upon the Czar of all the Russias and ask him to aid in averting it. What was the success of their mission? The war broke out the next year in the Crimea. Now, I think everybody will admit that to the labors of Holley in perfecting the Bessemer steel process we owe the fact that the transportation of grain has been cheapened, so that it can be carried from the interior of this Continent and across the sea at a less cost than it can be grown there, and if ever there is anything done to abolish the present military burdens of Europe, it will be through the competition so established. It is to the labors of Alexander L. Holley that this grand result will be due. So much for one side. As to his private character I can say no better words than those of the poet:

"He leaves us free from griefs and cares,
Far nobler things than tears;
A host of friends without a foe
To honor him through the years."

MR. MARTIN CORYELL.

The tribute of respect I would offer to the memory of Mr. Holley originates in the talent displayed in the publication made by Colburn and Holley several years ago, from which I received great advantage. It was a very able book, and came out at a time when it did great good to the whole country. Since then I have been connected with him in this society as well as in business, and in every emergency he has been kind, conciliatory and obliging, adding greatly not only to my comfort, but to the comfort of all those about him. I can only say that I regard his death with the same feeling that I would that of a brother.

J. A. ECKERTSON.

Ladies and Gentlemen: My acquaintance with Mr. Holley began some ten years ago, when this society held its first meeting in this city. I have not, therefore, known him as long nor so intimately as some of you, and yet when I heard that he was dead I felt the keenest sense of personal bereavement; for in the warmth of his heart, and in the genial sunshine of his presence, acquaintance soon ripened into friendship. I have never before attended a meeting of this Institute, held for discussion or for social enjoyment, where Mr. Holley was not present, and where he was not—and I am sure there is no man here who will think he is disparaged when I say it—where he was not *facilis princeps*. It was my sad but precious privilege to be present at the house of one of our own members when a few of the friends of Mr. Holley gave him the little testimonial of affection and respect to which allusion has already been made. As Mr. Shinn said, no one who witnessed that scene can ever forget it—Mr. Holley standing upon what we all felt was the brink of the grave, for even then the coming event cast its shadow before. In the accents that fell upon our ears and sank into our hearts like a plaintive strain of sweet music, which was rendered even more touching by their modesty, we heard our friend chant his own requiem. Then, and not till then, some of us felt how dear he was to us. In the days of old, when the Latin language was a living tongue, the words *de mortuis nil nisi bonum*, became proverbial. When applied to our friend, these words have a new significance, for among the hundreds, or, perhaps, thousands, who knew him in his own country or beyond the seas, not one can say aught but loving words of him. Into the twenty-five years of his busy life he pressed half a century of the work of many an able man. Many of the proudest of the dead whom the world delights to honor, who reached the age of three score and ten years, leave no deeper footprints on the sands of time than he. True, he had been less unimpaired of himself, had he possessed less of that enthusiasm which alone makes great achievements possible, had he been less prodigal of his strength and resources, had he, in a word, not taken as his

creed, "It is more blessed to give than to receive," he might have been with us to-day. But then he would not have been the Alexander Lyman Holley whom we knew and loved, and we would not be exclaiming from the depths of our hearts:

"O for the touch of a vanished hand,
And the sound of a voice that is still!"

But, Mr. President, in the midst of our sorrow let us cast the key-note of the lesson of Holley's life. Let us profit by the example of our army friends when a comrade falls dead by their side. No matter how well he fought the good fight, no matter how noble a death he may have died, or how much he may have been beloved, no matter how muffled the drum or solemn the dirge or measured the tread of the fellow soldiers as they carry him to the grave, the last rites once over, the last tear shed, the last flower thrown upon the bier, they march briskly back, keeping pace to the music of an inspired thought, to the duties of life and the fight of to-morrow. Could our true friend speak to us to-day, would it not be in this spirit? Would he not say, especially to you who were his co-workers for so many years, and with him organized this Institute, whose efforts in the field of applied science have been rewarded with results which were a surprise almost to him as well as to you—would he not say, "Go on with the work so well begun, so successfully continued;" and might he not add in those familiar tones whose echoes will ever linger in our ears, "This do in remembrance of me."

MR. O. CHANUTE.

Mr. President: My acquaintance with Mr. Holley dates back seventeen years, although that was eight years before I saw his face. It was in 1865. I was in the West, and in want of information which I failed to gain in the books. I knew that the information would surely be in the possession of Mr. Holley, and I took the liberty of writing to him and making the necessary inquiry. I took care to write the letter in such a way that he could answer it in a few words if he chose. Almost by return mail I got from Mr. Holley, who was a very busy man, a letter of five or six pages, by which he laid me under an obligation which remained so warm, that when, eight years later, I came East, I took the very earliest opportunity of hunting him up. At that time we were thrown occasionally into contact with each other, meeting in either this society or the Society of Civil Engineers, and I grew to know him better and love him more and more. And now that he is gone I fail of words to express the regret I feel. I have listened to what has been said here, and each one upon rising has recognized the unity of great talents, of the highest possible right living and integrity with the most lovable character, and I feel that all that has been said will be insufficient to make those who knew him not, appreciate how this professional family felt for their lost brother.

MR. CHARLES MACDONALD.

Mr. Chairman, Ladies and Gentlemen: It is not for me to attempt to paint in words a picture of Alexander Holley's life, but I will be privileged to dwell for a moment upon that wondrous wealth of love in his intercourse with his friends. Who could know him and not feel that his character was the very personification of good-will toward his fellow-men? Who could ever have looked upon that joyous face, and not feel his own poor cares vanish? Who could have drawn and tasted of the sweetness, the gentle, and withal genuine, nobility that was there, and not wish to be more like him? Could any of us forget that we were privileged to hear his speech at the Philadelphia banquet? The foundation stone upon which Alexander Holley built was love. Brilliant intellect was there, indomitable will and perseverance to accomplish great things, but above and beneath all was an abiding willingness to spend and be spent for others.

But his friends will cherish him in their hearts among the loved ones who have made life better worth living, and in our own memory his will be ever fresh and green; and although we shall never more see his face nor grasp his hand in friendly salutation, the recollection of all the good deeds he has done, and all the good words spoken in the past, will prompt us to try and follow in his footsteps, and help others to do the right for the sake of the right, to spread abroad so far as in us lies the blessed doctrine of peace and good will.

Mr. J. F. Holloway, of Cleveland, read a tribute to Mr. Holley, the manuscript of which failed to reach us. We regret its omission.

Letters were announced from the following absent members: E. C. Peehlin, Cleveland, Ohio; P. Barnes, Springfield, Ill.; W. J. Taylor, Chester, Morris County, N. J.; V. Smith, McKeesport, Pa.; J. C. Bayles, New York City; W. F. Mattes, Scranton, Pa.; Prof. J. C. Smock, Rutgers College, New Brunswick, N. J.; W. R. Jones, Pittsburgh, Pa.; A. Cosgriff, Tilly Foster, N. Y.; E. B. Cox, Reading, Pa., and others.

The following cable dispatches were read:

LONDON, Feb. 21.

Dr. Drown, Secretary Institute of Mining Engineers, Washington, U. S. A.—The Council of the Civil Engineers, now sitting, desires to record its high sense of the eminent qualities of Mr. Holley, which won for him universal respect and esteem.

INSTITUTE CIVIL ENGINEERS,

London.

Secretary Mining Engineers, Washington, U. S. A.—As an English member I would testify to the unique regard in which Mr. Holley was held here as an engineer and man. I would add an humble personal tribute to his memory as metallurgist, brilliant engineer and generous friend.

S. G. THOMAS.

WORKINGTON, Feb. 22.

Dr. Drown, Secretary Mining Engineers, Washington.—I express my deepest sympathy with Mr. Holley's friends and countrymen in the irreparable loss sustained by them, and by us, through his departure.

G. J. SNEELS.

Dr. Drown.—I exceedingly regret that Mr. Holley has passed away from us. I join



PERFECTION WINDOW CLEANER CO.

TO THE TRADE.

Our price list for 1882 will be,

No. 1. Size, 7 inch. 2. 8. 3. 10. 4. 12. 5. 14. 6. 16. Price, 30 cents, 35, 40, 45, 50, 55 each. Discounts.—1 Cr. 25; 5, 30; 10, 35 per cent.



Handle Our Cleaner only—we own every Patent.

Our goods are for sale by all Large Dealers in Rubber, Woodenware, Fancy Hardware, Wholesale Grocers and Druggists. There is nothing in your line that is more saleable or will pay you better to keep in stock.

PERFECTION WINDOW CLEANER CO. Chicago, Ill. U. S. A.

ELBA IRON & BOLT CO., Limited.

MANUFACTURERS OF

MERCHANT BAR IRON,

Skelp Iron, Splice Bars, Railway Track Bolts, Car, Bridge, and Machinery Bolts, Nuts, &c.

We invite the attention of RAILROAD MEN especially to our make of SPLICE BARS and Track Bolts. Using the best brands of REFINED IRON, and paying close attention to the finish of our manufactures, we are enabled to offer our patrons BOLTS, NUTS, SPLICE BARS, &c., of excellent quality. Our works have been enlarged within a few years; all orders are now executed with promptness; all our work guaranteed.

SEND FOR PRICE LISTS AND INFORMATION TO

ELBA IRON & BOLT CO., Limited Pittsburgh Pa.

THE LEADING WRINGER OF AMERICA.

SIMPSON & GAULT (PEERLESS WRINGER CO.),

New York Office,
79 Chambers St.

European Offices,
Place Vendôme, Paris.

7 Poultry, London.

Office and Factory, CINCINNATI, OHIO.

THE

PEERLESS

CLOTHES WRINGERS.

Sold by the Jobbing Trade everywhere.

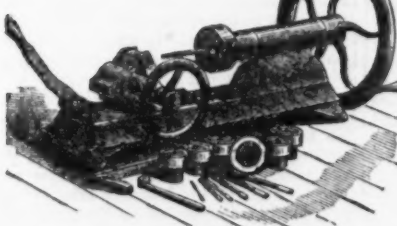
Most Saleable Wringer in the market.

MR. L. F. BLUE, who has been in our employ for a great many years, is our SOLE AGENT, and will visit the jobbing trade throughout the United States.

WILEY & RUSSELL MANUF'G CO.,

GREENFIELD, MASS.

Labor-Saving Machinery & Tools.



Bolt Cutters, hand or power, in great variety. Green River Drilling Machines for hand or power, with Screw Cutting attachment if desired. GREEN RIVER TIRE UPSSETTERS. GREEN RIVER TIRE BENDERS. Green River Blacksmith's Vises for welding heel and toe calks. Tire Measuring Wheels, Tire Nut Wrenches for removing nuts inside of felices, used in bit stock. Special Screw Plates for Machinists, Model Makers, Blacksmiths, Wheelwrights and Amateurs. SEND FOR ILLUSTRATED PRICE LIST.



Taps, Dies and Reamers for use in the bit brace.

The Celebrated "LIGHTNING" Screw Plates.

LOW MOOR IRON COMPANY,
Alleghany Co., Virginia.

PIG IRON.

Best Foundry Iron for Sale in Lots to Suit.

GEO. H. WHIPPLE, 56 Wall St., New York.

THE AMERICAN MACHINE CO.,

MANUFACTURERS OF

HARDWARE SPECIALTIES.

Office and Factory
Lehigh Ave. and American St., Philadelphia.

Branch House:

No. 128 Chambers St., New York

SPECIALTIES: Fluting Machines, Hand Fluters, Plaiting Machines, Christmas Tree Holders, Bickford Portable Pump, Mrs. Potts' Patent Cold-Handle "Crown" Irons, Ice Cream Freezers and Cake Mixing Machines.

BAEDER, ADAMSON & CO.,

Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

(Also in Rolls, for machine work.)

Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felt- ing for Covering Boilers, Pipes, &c., Cow Hide Whips.

Stores: PHILADELPHIA, 730 Market St., BOSTON, 143 Milk St., NEW YORK, 67 Beekman St., CHICAGO, 182 Lake St.

DUNNING FINISHED STEEL HORSE SHOES.

THE MOST POPULAR AND ECONOMICAL HORSE SHOE IN THE WORLD!

The Chicago Steel Horse Shoe Co.,

SOLE MANUFACTURERS,

20 West Lake Street, Chicago, Ill.

These shoes may be ordered in single or assorted sizes from the leading Hardware houses East or West. Among whom are:

Simmons Hardware Co., St. Louis.
W. B. Belknap & Co., Louisville.
Nichols & Dean, St. Paul.
W. J. Holliday & Co., Indianapolis.
Michael T. Horner & Co., Baltimore.
Lewis Shillinger, Syracuse.
Geo. Tritch, Denver.
Coombs & Co., Fort Wayne.
Locke, Hale & Co., San Francisco.
Pratt & Co., Elmira, N. Y.
Fowler & Sons, Buffalo, N. Y.

Dunning Sizes.....4, 6, 8, 10.

Correspond with Iron Shoe, 2, 3, 4, 5.



EASTERN DEPARTMENT.

PECK & GODDARD,

SOLE AGENTS

FOR ALL STATES EAST OF OHIO.

60 Liberty St., New York

These shoes are forged from a solid bar of steel.

Afford a natural, even bearing for the foot.

They will cure corns and improve tender feet.

Being a finished shoe it only requires the work of shaping and nailing on.

Send for sample keg (100 lbs.) assorted sizes.

Illustrated catalogue sent on application.

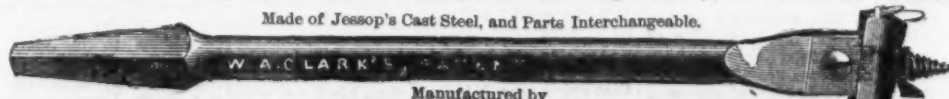
The Only Perfect Horse Shoe Ever Put on the Market.



WM. A. CLARK'S PATENT EXPANSIVE BITS WITH TWO CUTTERS EACH.

Small Bit Boring from 1/2 in. to 1 1/2 in.; Large Bit Boring from 3/4 in. to 3 in. Warranted.

Made of Jessop's Cast Steel, and Parts Interchangeable.



Manufactured by

R. H. BROWN & CO., Westville, Conn., Successors to W. A. CLARK.

NEW MAKE OF MINE LAMP.



J. C. F. D. BROS., Scranton, Pa.

AGENTS IN ALL FOREIGN COUNTRIES.



119 South Fourth Street,

PHILADELPHIA

Branch Office, 605 Seventh St. Washington, D. C.

H. HOWSON, Engineer and Solicitor of Patents.

G. HOWSON, Attorney at Law and Counsel in Patent Cases.

SEND FOR CIRCULARS.



TELESCOPE TUBES.

Fine Mandrel-drawn Tubes, from Brass or German Silver. Tubes for sliding one within the other made to order. Manufactured by ROBT. T. DEAKIN & CO., 500 N. 12th St., Philadelphia, makers of the American Improved Brass Garden Syringe.

R. P. SCOTT & CO.,

28 Orange Street, Newark, New Jersey,

Manufacturers of

ROTARY KNIFE PEACH PARERS, GOLD MEDAL APPLE

PARERS, SAFETY REVERSIBLE ICE CREEPERS, EGG

BEATERS, MELTING LADLES, &c. Also,

Scott's Peach-Pitting Machines.

COVERT MFG. CO.,

SOLE MANUFACTURERS OF



COVERT'S

PATENT HARNESS SNAPS,

Chain and Rope Goods.

These goods are sold by all leading jobbers in General and Saddlery Hardware at manufacturers' prices.

Send for illustrated catalogue and price list.

COVERT MANUFACTURING COMPANY,

WEST TROY, N. Y.

CINCINNATI ROLLING MILLS AND CHAIN WORKS

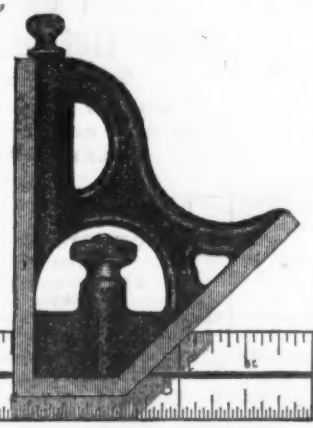
Manufacture Trace, Coil, Ox, Log and Wagon Chain, Fifth Wheels, Shackles and King Bolts, using only

Iron made at our mills from strictly selected Wrought Scrap.

OFFICE, 20 West Third Street. MILLS & WORKS, East & C. H. & D. E. R.

CHAPLIN'S PATENT

TRY SQUARE AND MITRE, SPIRIT LEVEL AND PLUMB.



A CARD.

This Tool is manufactured under the original patent granted O. R. Chaplin, May 3, 1866, reissued May 4, 1880, for a Combined Square and Bevel, having an adjustable or sliding blade drawn to its seat by a clamp bolt. The public are hereby cautioned against the sale or use of a similar tool made and put into the market by another party, fraudulently claiming the invention as his own, under the name of "Surrett's Patent Adjustable Square." Proceedings in the U. S. Court for the District of Massachusetts were commenced against said party for infringement of the Chaplin Patent in July, 1880, and a final hearing was reached at Boston the second week in January last. The case now only awaits the arguments of a decision of Judge Lowell. The aforesaid pretended inventor has recently commenced a counter suit against us, apparently for the express purpose of trying to frighten dealers by threat of suit for damages from handling the Chaplin Tool. All we have to say to the trade in this matter at present is, that we shall firmly maintain whatever rights the Courts may establish in our behalf, and shall object and defend all parties whomsoever in the use and sale of the Chaplin Tool manufactured by us.

STANDARD TOOL CO.,
ATHOL, MASS.
SOLE MANUFACTURERS AND OWNERS OF PATENT.

BRONZE GOODS

OF
New and Elegant
DESIGN
AND FINISH.



THE WHIPPLE MFG. CO.,
CLEVELAND, OHIO.

DOOR LOCKS, KNOBS, BELL PULLS, ETC.

Chain and Lever Bolts,
Sash Fasteners,
Gong Bells,
Door Springs,
Spring Hinges.

Builders' Hardware.

ILLINOIS IRON & BOLT CO.,
CARPENTERSVILLE, Kane Co., ILL.
MANUFACTURERS OF

BLACKSMITHS' TOOLS.



THIMBLE SKEINS.

LOCOMOTIVE JACK SCREWS,
SAD IRONS, COPYING PRESSES and STANDS, &c.

Prouty's Patent
PEERLESS FORCE PUMP.



Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING PACKING.

It will throw a continuous jet FROM FORTY TO SIXTY FEET. A new pattern jet and spray nozzle is sent with each pump.

Especially attention is called to the material and workmanship exhibited in these pumps.

LIST PRICE \$8.

THE NEW ENGLAND BUTT CO.
PROVIDENCE, R. I.

you all in spirit to-day in praise of his memory.
WINDSOR RICHARDS.
MIDDLEBOROUGH.

Dr. Drown.—We all mourn him and shall miss him greatly.
E. P. MARTIN.
BLANAVON.

LONDON, Feb. 22.

Dr. Drown, Secretary Mining Engineers.—Having traveled with friend Holley all over Europe, few can better testify to his talent and amiable character, and how deeply his European friends show the sorrow felt at his loss. The friendship for Holley in Europe was strong as steel and good as Swedish iron. United in this mournful condolence are Schneider, of Creusot, France; Greiner, of Seraing, Belgium; Longdon, of Krupp's, Germany; Ackerman, of Sweden, and numerous friends in England from whom I have received letters expressing deep sorrow. Honor to the land that produced such a man. Our consolation is that Alexander Lyman Holley is now formed in a better mold.
C. P. SANDBERG.

MR. J. D. WEEKS.

It was not my privilege to know Mr. Holley as long as some of those who have spoken, but I remember that a few years ago, in this very city, at the time he was president of this Institute, I met Mr. Holley. As a newspaper man I met Mr. Holley, and asked him for those favors that newspaper men are accustomed to ask of men of influence and position. I found him kind, generous, friendly, and I have always found him so at every time that I have approached him in the capacity that I have. And I wish to bear testimony, in behalf of the technical and scientific press of this country to their friend, to their fellow-laborer—for Alexander Holley was one of us in the early years of his life, and in his after years as an author, also, he was one of us—I wish to bear testimony to the extreme courtesy, to the great kindness and the great disinterestedness with which he has always met us, and with which he has always given us the best that he had to give. I thought, when reference was made to his connection with the Bessemer process, that he had received from his countrymen that honor that they give abroad to high merit and distinguished worth, and I thought that if Alexander Holley had not been one of us, he would have merited and received as high honor as that man to whom he is only second. And yet what matters it? He was Alexander the Conqueror in the arts; he is Alexander crowned king in our hearts, whose reign shall never end with the words, "the king is dead." When our chairman so beautifully referred to that sketch that our friend Holley made, there rushed to my mind that wonderful poem of Emerson, in which he describes the feelings, and the thoughts, and the aspirations, and the motives that animated those old cathedral builders in those old times. You remember the words: "Himself from God he could not free. He builded better than he knew: The conscious stone to beauty grew."

And as our chairman has so admirably said, has grown into the white glory of Milan or the splendor of York. And if you will allow a reference to the majestic Cathedral of York as we saw its glories, we went down and down and down with the verger, and he showed us, beneath the foundation of the cathedral, another foundation that dated back in the Dark Ages, when they had builded a beautiful cathedral to testify to what their ideas of glory and grandeur were; and in the coming days, in this grand social reform that has been spoken of by our first president, I again shall see a structure more grand and more glorious than that which exists at York. Somebody else will find the foundation that Alexander Lyman Holley laid, broad and deep and strong, and build thereon a structure worthy of his thought. I wish, Mr. Chairman, in closing, to offer these

RESOLUTIONS:

Resolved, That in the death of Alexander Lyman Holley, formerly President of the Institute, we mourn the departure, not only of a great inventor and engineer, pioneer in the applications of science, and benefactor of mankind, but also and more keenly, of a true comrade and dear friend, the memory of whose strong and gentle spirit is indissolubly blended with the social history of this organization, as his genius, enthusiasm, and activity were potent factors in its professional success.

Resolved, That the chairman of this meeting be requested to deliver on some suitable future occasion an address in commemoration of the life and life work of Mr. Holley.

Resolved, That the Council of the Institute be requested to take into consideration the publication of a memorial volume, to contain the above-mentioned address, the proceedings of this meeting, and such other matters as may be deemed expedient.

Resolved, That we extend to the American Society of Civil Engineers and to the American Institute of Mechanical Engineers our sympathy in this great loss, sustained by them as well as ourselves.

Resolved, That a committee of five be appointed to take charge, after consultation with the council, and in co-operation with such similar committees as may be constituted by our two sister societies, of the execution of the measures proposed in these resolutions, and to represent the American Institute of Mining Engineers in any further proceedings that may be taken for the same purpose.

Resolved, That a copy of these resolutions, together with the assurance of our profound sympathy, be transmitted by the secretary to the family of Mr. Holley, and that copies be sent also to the secretaries of the American Institute of Mechanical Engineers and the American Society of Civil Engineers.

(Carried.)

Dr. Raymond, who accepted the task of preparing a memorial paper, then read two letters, one from Mr. Holley, written to him several years since, and another from Mrs. Holley to the American Institute of Mining Engineers, expressing her thanks for the deep sympathy and sorrow shown at the loss of the eminent engineer and friend.

An Old Locomotive.—The following description of an old engine on the Great Western Railway of England, recently ap-

peared in an English exchange: "The 'Thunderer' was an engine built by Brunel, and constructed by Messrs. Hawthorn in 1837, the patent being that of Mr. T. E. Harrison, who later on became chief engineer of the Northwestern Railway. The boiler was on a separate six-wheeled frame, the engine proper running in front with four coupled 6-foot wheels. The cylinders were 16 x 20 inches, and the shaft spur-gear 3 to 1 on the driving axle, thus making the driving wheels revolve as rapidly as if they had been 18 feet in diameter. Boiler, 44 inches diameter; 135 tubes, 1 1/2 inches diameter, 8 feet 7 inches long; fire-box very large, with a hind feather; grate area, 17 1/2 square feet; heating surface tubes, 516; box, 108 1/2; total, 624 1/2 square feet; weight of engine proper, 12 tons; diameter of chimney, 16 inches. It had a very short career, its light weight and small tractive force (24.17 pounds) being insufficient. The grate was 3 feet 8 1/2 inches long by 5 feet wide, and the box was 3 feet 11 inches high above the grate."

WASHINGTON NOTES.
(From Our Own Correspondent.)

WASHINGTON, D. C., March 8, 1882.

The McKinley Iron and Steel Bill still hangs fire in committee, and the Tariff Commission Bill is not making much better headway in either the Senate or the House. In the Senate there is little disposition to give time for the labored essays which are periodically put forth on the latter subject. It looks very much as if this indifference, and the long intervals which interpose between speeches, was a polite way of letting the question down easily. For instance, a week ago, Mr. Slater, from the remote state of Oregon, proposed to regulate the Senate upon some Columbia River ideas on the tariff, and notified the Senate that he would call up the bill "to provide for the appointment of a commission to investigate the question of the tariff, &c." When the time came, he was crowded out, the Chinese question and Polygamy evidently interesting the grave and worthy Senators more than tariff commissions.

In the House, Representative Kasson yesterday moved to suspend the regular order, the report of committees, for the purpose of going into Committee of the Whole for the consideration of the Tariff Commission Bill. The motion being carried, Mr. Kasson then moved to take up the Commission Bill, and was immediately antagonized by the Agricultural Appropriation Bill and several other measures. The Committee on Appropriations generally supported Mr. Kasson. The Speaker ruled the Commission Bill out of order, on the ground that it was not a revenue measure, which led to considerable discussion. Mr. Kasson, however, failed to get up his bill, but announced that he will call up bills on the calendar until the Tariff Commission Bill is reached. This measure, when reached, will lead to a protracted and spirited discussion, covering at least three or four weeks. The speakers thus far announced are Kasson, of Iowa; Speer, of Georgia; Errett, of Pennsylvania; Carlisle, of Kentucky; Dunnell, of Minnesota. Ex-Speaker Randall will make a short speech. He says the bill will pass, as it will receive the support of at least forty or fifty Democrats. Judge Kelley says that he will not make a set speech, but will interject such remarks as emergencies may suggest.

It is very apparent that the friends of the tariff commission scheme are afraid to come to the issue of a vote on any preliminary question, for fear of summary action on the part of the House. It is not likely, however, that this will happen at so early a moment. A number of gentlemen, who have elaborate speeches prepared, view the subject from divers standpoints, and it would be a terrible hardship to prevent them from relieving themselves of the results of so much intellectual combustion. Representative Hewitt, of New York, who is a large manufacturer, has gathered up a good supply of ammunition, with which he proposes and expects to demolish the strong positions of the friends of the measure. This gentleman is emphatically opposed to this method of handling the tariff question, and his influence in the House, among the Democrats, is certain to carry a large vote in the same direction. Mr. Hewitt believes in going at the tariff question directly, and not "through the crucible," as he termed it, to a commission of cranky political economists. He thinks the representatives of the people, their interests and industries, are the proper persons to determine what is best for both. Besides, he says, they are responsible to that high tribunal, the people, while a commission would be responsible to nothing, and would submit, perhaps, some beautiful theories, which would explode upon the first test. All of this, he thinks, would only complicate the subject and render action absolutely impossible at the present session.

Mr. Hewitt is not the only one who thinks this way. There are, of course, many who will support the idea of a commission, and the discussion, while it lasts, will be interesting, because it will present the arguments for and against a commission. It looks very much, from the timidity of Mr. Kasson and other friends of the bill, as if they were anticipating a sort of an up-hill fight, with the prospect of a motion to table, before many days. At present, this bill blocks the way to all consideration by the House of tariff matters in general—iron and steel or any other article in particular.

During the past week a number of important petitions have been submitted to the House from different sections of the country in relation to the duty on iron and steel. This subject is attracting universal attention. Evident fears are entertained by manufacturers, and workmen are beginning to evince some uneasiness over the delay. Representative Barr, of Pennsylvania, whose district contains the counties of Dauphin, Lebanon and Northumberland—one of the principal iron sections of the State—has presented three petitions from citizens of Harrisburg urging the passage of the McKinley bill. Another petition, introduced by Mr. Miller, of Pennsylvania, is signed by 80 iron-workers of Wheatland, Mercer County, and still another of 75 workmen of Sharon. Also one from manufacturers representing

15 manufacturing establishments in the Shannango Valley, Mercer County. In addition, Senator Mitchell presents the petition of E. A. Barnes and others, citizens of Pittsburgh, Pa., asking the passage of the McKinley bill. The Sherman bill, to change the method of interpreting controverted questions relating to duties on iron and steel, has received another blow from Philadelphia. Senator McPherson has presented a memorial, signed by 46 prominent importers of that city, remonstrating against the passage of the bill abolishing the right of trial by jury of questions as to the rates of duty under tariff laws, and substituting instead an appeal to the Secretary of the Treasury, or to the Court of Claims, upon any question of lawful rates or assessments of duty, the decision of either to be final. This document reviews the whole ground very forcibly, and is before the Senate Committee on Finance, where the Sherman bill is pending.

The House Committee on Manufactures met yesterday, when General Campbell, its chairman, called up the bill providing for the appointment of a commission to be charged with certain tests and experiments in iron, steel and other materials used in mechanical structures. He fully explained the necessity and object of the proposed tests. He referred to the recent meeting of the American Institute of Mining Engineers, held at the Smithsonian Institution in this city, in which it was clearly proven that American engineers are now chiefly dependent on formulae for the calculation of strength of iron, steel, &c., based on experiments on foreign materials and manufactures, which differ in many of their characteristics from those of American production. He stated that the security of lives and property were involved, and the increased uses of metals in all departments of mechanical industries rendered this movement still more important. The old tables were inaccurate and incomplete and could not be relied upon. Therefore he was in favor of the bill, and desired to have action as early as consistent with a proper consideration of the whole subject.

The chairman further stated that he would suggest to the committee that experts, or others interested, be requested to submit their views on the bill to the committee, either in person or in writing. This suggestion met with general approval, and there being no parties directly interested present, the bill was laid over until they could be heard from. In order to bring this matter properly before the committee, it would be well for the proper parties, members of the Institute of Mining Engineers and experts generally, to correspond with the chairman of the Committee on Manufactures, Gen. J. M. Campbell, and make their arrangements for a hearing. The following is the text of the bill introduced by General Campbell, and which meets the approval of the Institute of Mining Engineers:

A BILL authorizing the President to appoint a commission of experts, skilled in the investigation, production and use of metallic substances and other structural materials, to execute tests and experiments on iron, steel and other materials used in the construction of bridges, buildings and mechanical structures, and deduct useful rules therefrom:

Be it enacted, &c., that the President of the United States be, and he is hereby, authorized to appoint a commission of seven members, selected from among men skilled in the investigation, production and use of metallic substances and other structural materials, to hold their appointment during the pleasure of the President of the United States, which commission shall plan and superintend the execution of such tests and investigations of materials used extensively in the construction of buildings, bridges, ships and other structures, and machinery, as it shall think most important to be made, and from time to time publish results of the tests and investigations, and also such scientific principles and such practical rules deduced therefrom as it shall consider most useful. The said commission shall organize itself and adopt such rules and make such assignment of duties among its members as it shall deem most promotive of the object of its appointment. Vacancies occurring from time to time in said commission shall be filled by the President of the United States.

Sec. 2.—That the said commission shall report its work, with its results and the deductions made therefrom, annually, to the Secretary of the Interior; and its accounts shall be settled in the Interior Department, through such channels as the Secretary shall direct.

Sec. 3.—That the members of said commission shall be entitled to mileage and other necessary expenses incurred in the prosecution of their duties, but no salaries as members of the commission.

Sec. 4.—That the said commission is hereby authorized to appoint a principal expert, who shall personally conduct the examinations and tests which the commission shall direct, with such assistants and laborers as may be necessary, and also to purchase such material for test and investigation as may from time to time be required.

Sec. 5.—That this act shall take effect immediately.

Judge Kelley, chairman of the Committee on Ways and Means, has introduced a bill in regard to relieving certain productions, such as spices, from duty. Judge Kelley, referring to this bill, says that the principle involved is an enlargement of the free list in the matter of raw materials. He thinks some action will sooner or later be taken to deliberately consider this abstract proposition, as it will very decidedly simplify the tariff, and lead to the avoidance of discriminating duties.

The action of the Committee of Ways and Means a few days ago, in refusing to authorize a report of the McKinley Iron and Steel Bill, or of a simple hoop iron bill, practically settles this question until the tariff commission project is disposed of. As soon as this is out of the way, it is understood that the McKinley Bill shall be reported and be considered on its merits, independently of the former bill. The passage or defeat of the Commission Bill will have nothing to do with the consideration of the iron and steel bill, as far as consideration is concerned. These languishing industries, however, meanwhile will have to suffer.

It is stated that a number of London gentlemen have determined to establish a large forge at Barrow-in-Furness, England, on modern principles, with producing power equal to that of the largest forge in the kingdom. The great drawback to the growth of Barrow is the scarcity of house accommodation, in many instances four or five families living in one house. During the past few months 600 tenements in the form of Scotch flats, have been erected, and as many as are habitable are occupied. Fully 2000 more houses are wanted in the town. It is stated that an East Coast firm of builders have purchased a plot of land on which they propose to erect 400 cottages suitable for clerks, foremen and workmen.

Special Notices.

IRONWORK.

Sealed proposals will be received until March 15, 1882, for furnishing the Iron Beams, Girders, &c. (200 tons more or less), required in the new buildings of the Fitch Institute, in the City of Buffalo, in accordance with the plans and specifications, which may be seen at No. 10 Court St., in the City of Buffalo. The committee reserve the right to reject any and all proposals. Address: JOSIAH G. MUNRO, Sec'y, 223 Washington St., Buffalo, N. Y. By order of the Committee, J. G. CUTLER, Architect.

For Sale.

The Tyler Hoe and Tool Works, located at Ironton, Lawrence County, Ohio. This property is well adapted for manufacturing hoes, picks, mattocks, &c.; is in good repair, and can be started immediately. Iron, steel and fuel of best quality can be obtained at a minimum cost. Shipping facilities, both rail and water, are excellent. Will be sold at a reasonable figure and upon easy terms. Address B. M. CALDWELL, Secretary, Ironton, Ohio.

Presses for Sale.

Three small Power Punching Presses, in first-class order. They have heavy fly wheels; two are 13 in. diam., and one 16 in. Price \$75 each (cost \$150). Also two large new Punching Presses; weight, 1200 each; box frame style; height, 5 feet; throat, 6 inches; opening in bed, 5 x 8; balance wheel, 30 x 1/2, weighing about 300 pounds. Address: FERRISS PUNCH AND SHEAR CO., 115 W. Liberty St., New York.

Wanted.

Steam Hammer; 500 to 650 pound Hammer Ferris & Miles preferred. Give full description, weight, size and lowest price for cash. Address CHAS. D. PIERCE, 29 Rose St., New York.

Wanted.

The advertiser desires to secure information of where he can have rolled a Steel Band 300 feet long, 6 inches wide and 1/2 inch thick. Address, with full particulars, C. M. C., Office of The Iron Age, 220 S. 4th St., Phila., Pa.

Salesmen Wanted.

Traveling Salesmen in the Stove and Hardware line will learn something to their advantage by addressing L. K. SMITH & CO., Troy, Ohio, Manufacturers Smith Patent Stove Carrier.

A Young Man

Of 27, who has had nine years' experience in the iron business, desires a situation. Had charge of charcoal furnace and forge two years. Has had experience at mines. Understands bookkeeping and correspondence. Best of references from present and former employers. Address: IRON, Office of The Iron Age, 220 S. 4th St., Phila., Pa.

Wanted.

A competent and experienced Blast Furnace Man to take charge of the running of two anthracite furnaces at Port Henry, N. Y. Address, with references, W. T. FOOTE, Agent, Port Henry, Essex County, N. Y.

Wanted.

A thoroughly competent, experienced man, one that understands the mixture of iron and the management of men, as Foreman of an old established Car Wheel Works in New York State. None others need apply. Compensation liberal. Address: CAR WHEELS, Office of The Iron Age, 83 Reade St., New York.

Wanted.

A Partner in a Foundry and Machine Business, established in 1824. For particulars, Inquire of I. H. COLLIER, Poughkeepsie, N. Y.

Wanted.

Power Shear for cutting up bar iron scrap, large and small. Also small Power Punching Press. Also a good Iron Planer. Give weights, dimensions and prices. Box 1012, Post Office, New York.

D RILL PRESS FOR SALE.—A new Upright Power Drill Press, swings 22 inches, back geared, quick return motion, steel spindle and shaft, superior finish; weight, 600; height, 6 feet; price, \$110. Address: FERRISS PUNCH AND SHEAR CO., 115 W. Liberty St., New York.

WANTED.—A young man wants a position in a first-class Hardware establishment as Traveling Salesman, with ten years' experience in the General Hardware business, and has some experience on the road. Best of references. Address: P. O. BOX 93, Lewistown, Pa.

A YOUNG MAN 18 years of age wishes a situation as Bill or Entry Clerk. Can furnish the best of references. Address: D. H., Office of The Iron Age, 83 Reade St., New York.

WANTED.—By an active young man, who has had several years' experience with a Hardware store, situated as Traveling Salesman. Can command good trade in Ohio, Pennsylvania and New York. Address: BUSINESS, Office of The Iron Age, 83 Reade St., New York.

Special Notices.

For Sale.

Palo Alto Rolling Mills,

Near Pottsville, Pa.,

ON THE MAIN LINE OF THE POTTSVILLE AND READING RAILROAD.

These mills are in good repair, and can be started in two days' time. Rolls for T-Rails 12 to 70 lbs. per yard, and for Street Rails 12 to 70 lbs. per yard. Guide Mill Train for Merchant Iron 1/2 to 1 inch. Rolls for Merchant Bar, round and square, up to 4 1/2 inches.

Number of Puddling Furnaces in both mills, 3; Heating Furnaces, 2; all with boilers at each. Also Foundry, Machine Shop, Blacksmith Shops, Iron House, Roll House, Carver and Pattern Shops, Stables, handsome Dwelling for Superintendent, 11 Tenement Houses, a Brick Office, and ample grounds for stock and cinder. For further particulars address

Messrs. LEE & McCAMANT, Extrs., Pottsville, Pa.

THOS. F. WRIGHT, 1804 Race St., Philadelphia, Pa. HUGH W. ADAMS, 56 Pine St., New York.

Manufacturing Property for Sale.

The Real Estate of the late Foundry and Machine Company of Taunton, Mass. Buildings consist of Foundry, Machine, Erecting and Blacksmith Shops, and covering about 60,000 square feet of ground. For particulars apply to THE GEORGE PLACE MACHINERY AGENCY, 121 Chambers St., New York.

Car Works for Sale.

Present output about five cars daily. Either a personal interview, or full particulars may be obtained, by addressing the owner, X. Y. Z., Office of The Iron Age, 83 Reade St., New York.

For Sale.

Iron Shapers, 7 1/2 inch stroke, adjustable while in motion. Price, \$250 net, f. o. b. Send for photo. Address: NIAGARA STAMPING AND TOOL CO., Buffalo, N. Y.

For Sale.

Wholesale Hardware, in a flourishing Western city; trade good; can be largely increased; stock clean and new; good reasons given for selling; \$50,000 to \$75,000 required. To parties wishing to invest, no better opportunity can be offered. Address: C. H. R. & CO., Office of The Iron Age, 83 Reade St., New York.

For Sale.

Second-hand DROPS AND LIFTERS.

BEECHER & PECK, Lock Box 122, New Haven, Conn.

We Offer for Sale

The following from FULTON PIPE FOUNDRY Conshohocken, Pa.:

Three Cupolas, capacity 20, 35 and 40 tons in 12 hours. One 20-ton Steam Crane. One 15-inch Boiler, 48-inch diameter, 20 feet long; two flues 13-inch diameter. One large Hoisting Engine.

Two Blowing Engines, complete; capacity, 4000 cubic feet of air per minute. Two Proving Presses of best design. Three Straw-Twisting Machines, made by Reiliff Bros.

Also pipe tools, flasks, core barrels, &c. for making cast iron pipe, from 4 inches to 30 inches. For further information, apply on the premises, or of either L. & R. WISTER, 230 S. 4th St., or SHIRMER & CO., 230 S. 3d St., Philadelphia.

FOR SALE, CHEAP.

A complete set of Machinery for making wrought-iron butter boxes and back flaps. This is a rare opportunity for a party with small capital to get into an active business. Address, with real name and references, BUTTS, Office of The Iron Age, 83 Reade St., New York.

THE PARTNERSHIP

Heretofore existing between Thomas Hamilton and Thomas R. Kainer of the Philadelphia Wire Works have been dissolved by limitation. Thomas Hamilton having purchased the interest of Thos. R. Kainer, the business will be continued by the undersigned at the old stand, 120 to 122 Vienna Street. Thanking you for past favors and soliciting a continuance of the same, I remain, respectfully yours, THOS. HAMILTON, PHILADELPHIA, Jan. 1, 1882.

WANTED.—A gentleman residing in Texas desires to represent one or two manufacturers or jobbers of Builders' Hardware and Mechanics' Tools or general Hardware, on salary or commission. Has had fifteen years' experience in this line of trade, and is well posted also in cutlery, guns, ammunition, paints, oils and brushes. Good references will be given in New York City or St. Louis. Address LOCK BOX 214, Waco, Texas.

WANTED.—Position as Superintendent or Mill Manager; have had twenty-five years' practical experience; have for the last ten years been manager in iron and steel mill, merchant bar and guide mill and railroad supplies; will take position in works now running or with parties about to build new works. References given from present position. Address: MANAGER, Box 2, Office of The Iron Age, 83 Reade St., New York.

A THOROUGHLY EXPERIENCED SALESMAN, fully acquainted with Pig and Manufactured Iron trade, also practical mechanical knowledge of Pumps, Engines and Machinery, with extensive acquaintance with best trade in Middle and Western States, is open for engagement with first-class Commission or Manufacturing House, on good salary or paying commission. Address, with name and particulars, "EXPERIENCE," Box 60, Office of The Iron Age, 83 Reade St., New York.

HARDWARE.—Wanted, a first-class manufacturer, willing to represent in Chicago and the West; am thoroughly posted; big trade; good salesman; plenty of ambition. Refers to Wm. Blair & Co. and Chicago Stamping Co., my old employers. A. GUSTORFF, Room 13, 163 Washington St., Chicago, Ill.

PUNCHING PRESS AND SHEAR FOR SALE.—A punching press, 40 inch iron, also a power shear, 40 inch plate iron, 54 inches in width. Weight of each about 2000 pounds. FERRISS PUNCH AND SHEAR CO., 115 W. Liberty Street, New York.

Special Notices.

J. SEIDEL,

Commission Merchant,

Box 662, Habana, Cuba.

Will be happy to accept the representation of first-class houses manufacturing hardware.

Reference:

COLLINS & CO., 212 Water Street, New York.

For Sale.

A Valuable Iron Property,

KNOWN AS THE

POMEROY IRON WORKS,

Located at the junction of the Housatonic and Boston and Albany Railroads, in West Stockbridge, Mass. Tracks from each road into the furnace yard. This is the only Anthracite Furnace in New England. Product finds sale to the local trade; make about 8500 tons per year. Reputation of the iron first-class. The quality of the ores of the vicinity second to none. Daily shipments are made from the town to the Hudson River Furnaces at Troy and Hudson. Furnace fully equipped with tools. A small outlay will put the furnace in blast. The Ore Rights and Lime Quarry (the latter on the premises), with the Tools, 25 acres of Land, Tenement Houses and Barns will be included in the sale. For terms apply to WM. TURNBULL, Trustee of the late Thos. Pomeroy's Estate, 57 and 59 Worth St., New York City. For further particulars, address or call on W. M. KNEFFIN, On the premises.

FOR SALE OR TO RENT.

New, light Factory; 70,000 floor feet; 275 H. P. Corliss Engine, giving power at minimum cost.

Shafting, piping, elevator, &c., all complete and modern. Lowest insurance rates. Railroad siding and ample yard room. Immediate possession.

A large quantity of General and Special Machinery at low prices.

SHARPE RIFLE COMPANY, Bridgeport, Conn.

For Sale.

A complete manufactory, with a business of over thirty years' standing, in Agricultural Tools of high reputation, well-known to the hardware and export trade in the United States. Parties wishing to invest about \$50,000 in a very substantial and reliable business, will have every opportunity to investigate this by addressing AGRICULTURAL TOOLS, Office of The Iron Age, 83 Reade St., New York.

For Sale.

The largest stock of New and Second-hand Engines, Boilers, and general Machinery in the West. Send for Catalogue. Hoisting Outfits for Coal Mining and other purposes a specialty.

WARREN SPRINGER, 125 to 219 South Canal St., Chicago.

For Sale.

Horizontal Engines, 15 x 30 inch, slide valve; also 16 x 42 (Hewes & Phillips), with cut-off; 16 x 36 (Currier), with cut-off; 16 x 28 Upright Engine, with cut-off; one 15 H. P. Locomotive Boiler; one 4-ton "Olds" Freight Elevator; No. 2 Knowles Steam Pump. All the above guaranteed complete and in perfect order. For particulars address BELCHER & BAGNALL, 40 Cortlandt St., N. Y.

For Sale.

STEEL RAILS—IN STORE.

1000 Tons 40 lb. "Guests,"

1000 Tons 41 1/4 lb. "Rhymney,"

with Steel Fish Plates to match the 41 1/4 lb. Rails.

Iron and Steel Rails of any section, for delivery in the United States, or f. o. b. English ports.

WM. LAWRENCE STROUD,

104 John Street, New York.

For Sale.

The Industrial Works of Shamokin, owned and successfully carried on for a number of years by the late Wm. Brown, deceased, consisting of Foundry and Machine Shop, and a large stock of Patterns regarded as part of the property. Boiler Shop, Blacksmith Shop and Factory for the manufacture of heavy coal screens. Well located in the borough of Shamokin, Pa., with the best facilities for shipping by rail, and surrounded by a district contributing all the work that a shop of that kind can possibly turn out. The works are now running, but in a very short time possession can be given. Easy terms of payment are offered to suit a purchaser of limited capital. Offered for sale by WM. McILVAIN & SONS, Reading, Pa.

For Sale.

Stock of hardware, stoves and implements, and store furniture, in one of the best towns in Kansas.

Address: HARDWARE, Box 366, Salina, Kansas.

LARGE ENGINE LATHES FOR SALE.

One Lathe, 12 ft. bed, 24 in. swing, screw cutting, triple gear, compound rest, with cross-feed. One Lathe, 20 ft. bed, 35 in. swing, back gear, compound rest, cross and angular feed. One Lathe, 10 ft. bed, 20 in. swing, back gear. These Tools are in use, and can be seen at our factory.

THE STILES & PARKER PRESS CO., Middletown, Conn.

THE NEW ENGLAND

Manufacturers & Mechanics' Institute will hold their Second Annual Exhibition at Boston, in their specially constructed Exhibition Building, the largest in the United States, during SEPTEMBER AND OCTOBER, 1882.

Exhibitors invited from the whole world. Blank forms of applications for space sent upon application to JOHN F. WOOD, Treasurer, 35 Hawley Street, Boston, Mass.

Special Notices.

For Sale.

The one-story building, about 100 x 170, with two-story brick building adjoining, about 30 x 100, with water wheel and shafting; also a vacant lot, 100 x 200, adjoining, with water-power privilege. Water supplied by the Cohoes Company, located in the City of Cohoes, N. Y., and occupied by A. G. Peck & Co. as an ax factory. Apply to MORRISON & COLWELL, Troy, N. Y.

For Sale.

One 20-inch Engine, one 100-horse Locomotive Boiler, two large Pulleys, 30-inch; a 2-inch Rubber Belt, &c. All in good order, and will be sold for less than value to make room for larger. Can be seen running at AKRON RUBBER WORKS, Akron, Ohio.

For Sale.

From 750 to 1000 acres of coal land, with two 5-foot coal seams and all the minerals of Eastern Ohio and Western Pennsylvania; has good iron or steel manufacturing site, with railroad and Ohio River frontage. Inquire for printed circular of JNO. C. COUCH, Real Estate Agent, 129 Fifth Avenue, Pittsburgh.

FOR SALE LOW.—ENGINE.

A Vertical High-Pressure Steam Engine, complete. Cylinder, 24 in. by 48 in. Built by A. J. Sweeney & Son. Can be seen in daily use at our nail factory.

LA BELLE IRON WORKS, Wheeling, West Va.

For Sale.

Hardware Stock and Business of twenty years' standing, in a live manufacturing railroad town in Ohio. Stock about \$25,000. A rare opportunity. For particulars, inquire of T. B. RAYL & CO., Detroit, Mich.

For Sale.

A complete stock of Builders' Hardware and Agricultural Implements, situated in the growing city of BRIDGEPORT, CONN. Clean stock, good trade, good location. On account of poor health will be sold on easy terms. Address communications to SARGENT & CO., New Haven, Conn., or SARGENT & CO., New York, N. Y.

Bolt and Nut Machinery, &c., for Sale.

One-Header Lewis Oliver & Phillips, second-hand. Two-Header Burdick Forged Headers, second-hand. Two-Header Lowell Forged Headers, second-hand.

One Cold Upsetter or Header, Chapin make, second-hand. Will head 6-in. long by 1/2 open die. Two Key-Split Cutters, most improved style, second-hand.

One Double-Punch and Shears, Allatier No. 7, second-hand. One Thorn & De Haven Drill, second-hand. One Double-Bolt Cutter, Smith maker, little used. Also our full line of National Machinery Co.'s manufactures: Hot-pressed and Hot-forged Nut Machines; Bolt Cutters, National Head, 3 sizes; Double-Bolt Cutters, Tappers, Headers, Washers, Rivet, Track Bolt, Pointers, Burrens, and full outfit for Bolt and Nut manufacturers. Address NATIONAL MACHINERY CO., Cleveland, Ohio, the only specialists in the United States.

DESIRABLE MANUFACTURING SITE

For Sale or Rent.

Being the extensive property formerly occupied by the

BUFFALO IRON AND NAILWORKS AT BLACK ROCK, IN THIS CITY.

The buildings cover over three acres, and are of brick and wood, substantially constructed, and with steel roofs. They could easily be changed, if necessary, to suit almost any kind of business. Water and railroad communication to all parts of the country. Maps of the property, with full description, sent on application. P. P. PRATT or F. L. PRATT, Buffalo, N. Y.

For Sale.

A Valuable Charcoal Iron Property.

Located on the James River, 16 miles south of the Chesapeake and Ohio R. R. at Williamson, known as the SALISBURY FURNACE, on the Richmond & Allegheny Railroad, at which place there is a Railroad Station, a Post Office and Telegraph Station. The property is composed of 3000 acres of land. At the furnace there are five family houses, a grist mill and a store house ready supplied with goods for the work hands and the country round about, also a stable, blacksmith and wagon shop. The ore is taken from a tunnel in the mountain in tramway cars and dumped into a flume which runs down to the foot of the mountain. Water is brought along the side of the mountain in a flume to where the ore is dumped, and before it reaches the foot of the mountain the ore is thoroughly washed. The furnace will go out of blast about the first of February. It has made in this blast about 200 tons of first-class car wheel iron. The property will be sold on easy terms. Apply to EUGENE KELLY, 45 Exchange Place, New York, Jan. 7, 1882.

For Sale.

One Beam Engine, 25 x 48, in first-class condition in every respect, patent cut-off, Shive governor, exhaust pipe heater, 28 feet fly wheel, &c., all complete. Price \$1200; easy terms. Address: SHIMER & CO., 250 South 3d St., Philadelphia.

For Sale.

Two Corliss Condensing

Beam Engines,

32 in. x 72 in. cylinders. Address: THE HARTFORD ENGINEERING CO., Hartford, Conn.

For Sale.

A Hardware Manufactory, at Westville, Conn., consisting of Foundry, Machine Shop, Storehouse, and other buildings; also Water Power, Engine, Boiler, Patterns, Tools and Machinery used in the same. Address: THE BLAKE HARDWARE CO., New Haven, Conn.

FOR SALE.—Two of Munson Brothers' Patent Double-Geared Under-Running GRIST MILLS. Esopas stones, 42 in. diameter, counter shafts and pulleys, together with an extra set of stones; cast-iron cases; all complete and new; best Grist Mill made. Maker's price at factory, \$800. Will deliver all free on cars for \$850. Large Upright Iron Tubular Boiler, 120 H. P., nearly new. Cost \$2000; price \$800. Also injector, steam gauge, water gauge and low water alarm combined, pump, iron smoke stack, 28 in. diam., 50 ft. high; circular saws, wood filer machine, pulleys, shafting, belting, patent bolt bailing press; all new; will be sold separately or together; a bargain for cash. WM. IRWIN, 152 Broadway, New York.

Special Notices.

JOB LOT.

ELEY BROTHERS'

GENUINE BLUE CARTRIDGE CASES,

Twelve Gauge.

The best paper shell in the market. For sale cheap. Supply limited.

ALFRED FIELD & CO., 93 Chambers St., N. Y.

ROBERT R. HAYDOCK & CO.,

Auctioneers & Commission

Merchants, No. 75 Murray Street, New York, Solicit consignments of

Hardware, Cutlery, Stamped Tinware, Woodenware, House-furnishing Goods, &c., for Sale by Auction. Terms and further information may be had by addressing P. O. Box 160.

E. BISSELL & CO., Auctioneers.

Large, Special and Peremptory Trade Sale of

Hardware and Housefurnishing Goods,

On Thursday and Friday, March 16 and 17,

AT 10 O'CLOCK A. M., AT 83 CHAMBERS AND 65 READE STS., N. Y.

THURSDAY, March 16, the sale will comprise a large line of Shelf Hardware, Edge Tools, Axes, Chisels, Double Jack and Fore Planes; 1000 dozen Campbell & Johnston's and other makers' Files, &c., &c. Also, by order of an importer retiring from business, his entire balance of stock of German Hardware, comprising in part, 200 gross Brass Lamp and Acorn Hooks, 350 gross Picture Nails, 400 dozen Back Flaps, 40 dozen Cow Ties, 400 dozen Compasses, 100 dozen Dividers, 150 dozen Fluting Scissors, 50 dozen Sheep Shears, 50 dozen Padlocks, 500 dozen Tins, Cupboard and Mortise Locks; 120 Scotch Braces, 500 dozen Wardrobe Hinges, &c., &c. Also 100 dozen solid steel, black and polished Railroad Shovels and Spades; 90 dozen steel Garden Hoes, together with other lines of goods too numerous to mention.

FRIDAY, March 17, at 10 o'clock, special sale of Housefurnishing Goods, Table Cutlery, Stamped, Tinned and Enamelled Ware; Brushes, &c. Also 500 lots Tinned and Grey Enamelled Ware, can be direct from the factory, comprising a large assortment of Dish, Milk, Sauce and Fry Pans; Tea and Preserving Kettles, Wash Basins, Tea and Coffee Pots, &c., &c., comprising an immense stock of these staple and desirable goods. Buyers who want goods that they can make money on should not fail to attend these sales.

To Railroads, Mill Owners

and Contractors.

STRUCTURAL IRON WORK

FOR SALE.

Having purchased the Ironwork of the Main Centennial Building, situated in Fairmount Park, Philadelphia, we now offer the same in sections to suit purchasers. These buildings range in length in widths varying from 100 to 105 feet, and of any height, from 40 feet down to 25 feet, and in length from 100 to 700 feet. We have eight Spiral Stairways, in all over 500 steps.

Plans showing how all parts of these buildings may be utilized in railroad depots, &c., have been prepared by Messrs. Wilson Bros. & Co., of Philadelphia, civil engineers and architects, and can be seen at the office of Mackintosh, Hemphill & Co., Limited

EXPORTS

| Dutch West Indies. | Quam. | Val. | I. fluxes, | Quam. | Val. |
|----------------------------------|---------|------|------------------|-------|-------|
| Hdw., pkgs., 48 | \$560 | | Gas fixturs, cs. | 1 | 80 |
| Nails, kegs., 9 | 31 | | Shet. g'ds, csks | 1 | 80 |
| Clocks, pkgs., 1 | 51 | | Peckover, flks | 1 | 80 |
| Pum., gals., 377 | 260 | | Cop. gds, cs. | 10 | 1,000 |
| Cultery, cs., 1 | 112 | | Fountain, | 1 | 80 |
| Mf. iron, pkgs. 10 | 81 | | | | |
| Iron safe, cs., 7 | 75 | | | | |
| Mf. iron, pkgs., 6 | 77 | | | | |
| Dutch East Indies. | | | | | |
| Pum., gals., 330,000 | 35,200 | | | | |
| Dutch Guiana. | | | | | |
| Pum., gals., 400 | 500 | | | | |
| Hdw., pkgs., 10 | 330 | | | | |
| Hamburg. | | | | | |
| Pum., gals., 7,474 | 55,455 | | | | |
| Sew. ma., cs., 133 | 2,045 | | | | |
| Typewriters, cs., 14 | 409 | | | | |
| Hdw., pkgs., 47 | 2,107 | | | | |
| Mach'y, pkgs., 5 | 1,454 | | | | |
| St. pumps, cs., 1 | 1,387 | | | | |
| Ore, box., 1 | 40 | | | | |
| Nick g'ds, cs., 3 | 480 | | | | |
| Watches, cs., 3 | 375 | | | | |
| Windmills, cs., 3 | 39 | | | | |
| Ag. imp., pkgs., 511 | 19,381 | | | | |
| Iron, pkgs., 2 | 117 | | | | |
| Clocks, bxs., 52 | 1,003 | | | | |
| Mf. iron, pkgs., 4 | 375 | | | | |
| I. r. g'ds., pkgs., 5 | 475 | | | | |
| Bremen. | | | | | |
| Mach'y, pkgs., 30 | 840 | | | | |
| Hdw., pkgs., 121 | 1,021 | | | | |
| Old metal, bbs., 6 | 325 | | | | |
| Ag. imp., pkgs., 10 | 1,003 | | | | |
| Pum., gals., 10,912 | 102,135 | | | | |
| Clocks, bxs., 1 | 140 | | | | |
| Elaunore. | | | | | |
| Pum., gals., 509,507 | 49,319 | | | | |
| Stettin. | | | | | |
| Pum., gals., 509,507 | 44,595 | | | | |
| Antwerp. | | | | | |
| Pum., gals., 148,588 | 24,414 | | | | |
| Mach'y, pkgs., 1 | 105 | | | | |
| Clocks, cs., 3 | 39 | | | | |
| Mf. iron, pkgs., 64 | 1,003 | | | | |
| Ag. imp., pkgs., 35 | 509 | | | | |
| Rotterdam. | | | | | |
| Hdw., pkgs., 4 | 50 | | | | |
| Iron drums, 1 | 1,002 | | | | |
| Ag. imp., pkgs., 25 | 180 | | | | |
| Pum., gals., 22,762 | 16,600 | | | | |
| Clocks, bxs., 5 | 115 | | | | |
| Gasburners, cs., 1 | 170 | | | | |
| Odesa. | | | | | |
| Ag. imp., pkgs., 163,869 | | | | | |
| Pumps, pkgs., 28 | 1,881 | | | | |
| Hdw., cs., 1 | 805 | | | | |
| Mf. iron, pkgs., 30 | 322 | | | | |
| Copenhagen. | | | | | |
| Pum., gals., 225,429 | 16,000 | | | | |
| Hdw., pkgs., 6 | 684 | | | | |
| Mach'y, pkgs., 4 | 1,150 | | | | |
| Ag. imp., pkgs., 537 | 14,375 | | | | |
| Christiansand. | | | | | |
| Pum., gals., 83,983 | 6,310 | | | | |
| Konigsberg. | | | | | |
| Pum., gals., 184,155 | 13,520 | | | | |
| West Hartlepool. | | | | | |
| Hdw., pkgs., 6 | 300 | | | | |
| Liverpool. | | | | | |
| Metal g'ds, cs., 1 | 170 | | | | |
| Car waxes, 5 | 80 | | | | |
| Pum., gals., 36,800 | 5,204 | | | | |
| Naph. gals., 145,594 | 10,215 | | | | |
| Carburets, cs., 1 | 117 | | | | |
| Clocks, bxs., 187 | 5,100 | | | | |
| Hdw., pkgs., 700 | 3,104 | | | | |
| Brake lin. pgs., 20 | 1,850 | | | | |
| Mach'y, pkgs., 20 | 4,054 | | | | |
| Rifles, cs., 1 | 40 | | | | |
| Cartridges, pgs., 4 | 300 | | | | |
| Revolvers, cs., 3 | 971 | | | | |
| Ag. imp., pgs., 1 | 30 | | | | |
| London. | | | | | |
| I. r. g'ds., cs., 1 | 500 | | | | |
| Ag. imp., pkgs., 618 | 7,398 | | | | |
| Hdw., pkgs., 116 | 9,817 | | | | |
| Pum., gals., 1,056,611 | 91,124 | | | | |
| Cartridges, cs., 550 | 9,625 | | | | |
| Mf. iron, pkgs., 17 | 552 | | | | |
| Sew. ma., cs., 1,000 | 39,094 | | | | |
| Clocks, bxs., 1 | 115 | | | | |
| Headlight, 1 | 10 | | | | |
| R. r. cars, 1 | 7,500 | | | | |
| Fire engines, 4 | 503 | | | | |
| Locomotive, 1 | 8,000 | | | | |
| Per. caps., cs., 6 | 305 | | | | |
| China. | | | | | |
| Hdw., cs., 2 | 109 | | | | |
| Cartridges, cs., 2 | 136 | | | | |
| Firearms, cs., 2 | 100 | | | | |
| Mf. iron, pkgs., 2 | 100 | | | | |
| Clocks, pkgs., 6 | 108 | | | | |
| Pum., gals., 958,158 | 109,140 | | | | |
| Genoa. | | | | | |
| Ag. imp., pkgs., 28 | 300 | | | | |
| Canada. | | | | | |
| Mf. iron, pkgs., 21 | 109 | | | | |
| British North American Colonies. | | | | | |
| Pig iron, tons, 195 | 3,900 | | | | |
| Mf. iron, pkgs., 3 | 300 | | | | |
| British Guiana. | | | | | |
| Hdw., pkgs., 2 | 40 | | | | |
| Mach'y, pkgs., 2 | 40 | | | | |
| Computators, 2 | 40 | | | | |
| Brit East Indies. | | | | | |
| Pum., gals., 725,400 | 85,255 | | | | |
| British Possessions in Africa. | | | | | |
| Pum., gals., 297 | 2636 | | | | |
| Pum., gals., 17,300 | 3,933 | | | | |
| Ag. imp., pkgs., 92 | 1,453 | | | | |
| New Zealand. | | | | | |
| Mf. iron, pgs., 14 | 210 | | | | |
| Clocks, cs., 15 | 669 | | | | |
| Havre. | | | | | |
| Pumps, pkgs., 10 | 1,200 | | | | |
| Ag. imp., pkgs., 160 | 3,850 | | | | |
| Mach'y, pkgs., 1 | 800 | | | | |
| I. r. g'ds., cs., 1 | 110 | | | | |
| Sew. ma., cs., 25 | 540 | | | | |
| St. pumps, cs., 2 | 6,074 | | | | |
| Mf. iron, pkgs., 3 | 40 | | | | |
| Platinum, cs., 1 | 6,700 | | | | |
| French West Indies. | | | | | |
| Pum., gals., 500 | 64 | | | | |
| French Possessions in Africa. | | | | | |
| Pum., gals., 81,700 | 8,917 | | | | |
| Naphtha, gals., 300 | 400 | | | | |
| Constantinople. | | | | | |
| Hdw., pkgs., 2 | 25 | | | | |
| Oporto. | | | | | |
| Pum., gals., 5016 | 400 | | | | |
| Leghorn. | | | | | |
| Mach'y, pkgs., 9 | 800 | | | | |
| Argentina Republic. | | | | | |
| Hdw., pkgs., 3 | 380 | | | | |
| Nails, cs., 15 | 75 | | | | |
| St. pumps, box, 1 | 25 | | | | |
| Mf. iron, pkgs., 1 | 25 | | | | |
| Pum., gals., 40,000 | 4,000 | | | | |
| Clocks, bxs., 27 | 750 | | | | |
| W. mills, pkgs., 5 | 39 | | | | |
| Ag. imp., pkgs., 23 | 3,761 | | | | |
| Sew. ma., cs., 67 | 1,190 | | | | |
| I. r. g'ds., cs., 2 | 250 | | | | |

IMPORTS

| Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending March 8, 1882: |
|---|
| Hardware. |
| Alexandre F. & Sons |
| Arctic Ice Mach. Co. |
| Blumenthal A. & B. |
| Bloomsfield J. C. & Co. |
| Boker Hermann & Co. |
| Scythos, cs., 6 |
| Chains, lengths 7 |
| Degraw, Aymar & Co. |
| Folsom H. & D. |
| Field Alfred & Co. |
| Cases, 29 |
| Arvills, 2 |
| Chains, cs., 17 |
| Forrester S. C. |
| Machinery, cs., 2 |
| Flaherty R. |
| Iron, bars, 7 |
| Grav. Cutlery Co. |
| Cutlery, cs., 6 |
| Hartley & Graham. |
| Cases, 45 |
| Hoe R. & Co. |
| Hitchcock, Dermody & Co. |
| Machinery, cs., 2 |
| Keating T. R. & Co. |
| Testing mach., cs., 2 |
| Lichtenberg Cha. |
| Machinery, cs., 10 |
| McCoy & Sanders |
| Chains, cs., 12 |
| Meyer F. R. & Co. |
| Ironware, cs., 15 |
| Moss F. W. |
| Files, cs., 10 |
| Moore's Sons J. P. |
| Cases, 3 |
| Cutlery, cs., 3 |
| Negus J. S. & J. D. |
| Cases, 1 |
| Pim, Forward & Co. |
| Packages, 18 |
| Pillar sheet walls, 6 |
| Valves, 14 |
| Tubes, blis., 15 |
| Tubes, 15 |
| Rogge & Co. |
| Needle, cs., 3 |
| Scott Wm. P. |
| Cases, 5 |
| Vom Cleff & Co. |
| Cutlery and hdw., cs., 19 |
| Waelflaer & Wood |
| Iron hooks, cs., 112 |
| Winchester Rep. Arms Co. |
| Guns, pgs., 4 |
| Wienbach, Hilger & Co. |
| Cutlery, cs., 2 |
| Witte John G. & Bro. |
| Cutlery, cs., 4 |
| Young Am. Press Co. |
| Iron Press, cs., 2 |
| Order. |
| Engines, bbs., 2 |
| Machinery, pkgs., 63 |
| Cases, 1 |
| Anchor, 1 |
| Iron. |
| Barling Bros. & Co. |
| Pig, tons, 184 |
| Old rails, tons, 700 |
| Wire rods, coils, 429 |
| Brown Bros. & Co. |
| Bars, 1876 |
| Cutlery, cs., 847 |
| Waste, hlds., 4 |
| Old chain, lot |
| Byrne Jos. & Co. |
| Scrap iron, plates, 8 |
| Carey & Moore. |
| Wire bds., 267 |
| Wire rods, coils, 375 |
| Coddington T. B. & Co. |
| Sheet iron, bds., 559 |
| Gt. West. Desp. Co. |
| Pig, tons, 210 |
| Merchant's Dispatch Co. |
| Wire, cs., 21 |
| McCoy & Sanders |
| Sheet iron, bds., 223 |
| Mason J. W. & Co. |
| Old wire rope, cs., 70 |
| Moore J. B. & Co. |
| Old wire rope, coils, 255 |
| Morton, Bliss & Co. |
| Rails, 3155 |
| Milken & Smith |
| Wire rods, bds., 3500 |
| Naylor, Benson & Co. |
| Bars, 283 |
| Ogden & Wallace |
| Sheets, 514 |
| Phelps, Dodge & Co. |
| Sheets, cs., 53 |
| Pim, Forward & Co. |
| Railway iron, tons, 53 |
| Wells, Fargo & Co. |
| Bars, 72 |
| COAL. |
| The event of the week in the Anthracite Coal trade is an agreement of the operators to suspend mining on the last three days of this week, next week and the week following, and on days later in the season if deemed necessary. The text of this agreement is as follows: "For the month of March the idle days shall be the 9th, 10th, 11th, 12th, 13th, 23d, 24th and 25th, and for the remainder of the season of 1882, as many in each month as may be considered necessary for the benefit of the trade, provided that no stoppage shall be over three days in any one week." Mr. Sam Sloan, of the D. L. & W. Co., agrees as to March and adds: "As to the rest of the season there need be no apprehension as to our course if the stoppage at any one time does not exceed three days." This is virtually the adoption of the policy acted upon last year, and the result prepares the way for fixing the opening prices for the spring season, which took place last year March 20. Until this is done little buying is expected, as consumers meanwhile naturally hold aloof. At present the dullness is excessive and prices are nominal. There is no pretense that schedule prices are realized. The prospects of an advance during the season can only be conjectured. The quantity of coal now stored at tidewater does not differ essentially from the amount stored at the corresponding date one year ago, but domestic consumers have a larger balance left over from the winter. Bituminous is dull, and uncertainty prevails on account of impending difficulties in the Cumberland region, where the miners resist the proposed reduction of 10¢ per ton (designed to equalize the wages paid in the Cumberland and Clearfield regions), and will go out on a strike on the 15th inst. The proposed lease of cars by the Pennsylvania Railroad Company, at a certain rate per annum, is also a matter not yet fully understood. Bituminous in New York alongside is quoted \$5.15 @ \$5.25, but at present there is nothing doing at this point. The freight rate from Baltimore is \$1.50. Eastward, the rate is \$1.25 to Boston, and 80 cents to Providence. Business very slack. The total tonnage of Anthracite Coal from all the regions for the year is 3,251,898 tons, against 3,630,979 tons for the same period last year. The total amount of Bituminous mined for the year is 675,183 tons, against 542,734 tons for the corresponding period last year. |

PHILADELPHIA.

Office of The Iron Age, 220 South Fourth st., PHILADELPHIA, March 7, 1882.

Pig Iron.—There has been quite a change of feeling in Pig Iron during the past week. Instead of firmness and confidence, there are evidences of timidity and weakness. It is difficult to account for this change of feeling, but as a statement of fact it cannot be denied. The general position appears to be substantially unchanged, and it is possible that the loss of confidence is (to some extent at least) due to the unsettled condition of the money market, the weakness in stocks and securities, and the frequent announcements of suspensions and failures. As regards Pig Iron, fortunately there are no large stocks, and furnaces appear to have no difficulty in moving their product at very slight concessions from market rates. In fact, the leading concerns are sold up to May—some up to midsummer, and there is no falling off in consumption, so far as we can learn. The ground of complaint seems to be that people are not buying. It may be said, on the other hand, that they are consuming rapidly, and so long as there are no surplus stocks hanging over the market there is no real cause for alarm. If consumption can be maintained prices cannot recede very far. The statement just published by Mr. Swank shows a probable consumption during 1881 of 4,982,565 tons, against 4,641,564 tons production, leaving a margin of 341,000 tons to be drawn from stocks or imported. The question of greatest importance at the moment is in regard to consumption. If that can be maintained there is not much danger of a decline in prices. So far during the year it is beyond doubt that consumption has been larger than in 1881. As to the future, appearances are not at all unfavorable. All departments are actively employed, and in many branches it will take weeks and months to finish up their contracts. It is true that there are not so many new orders on the market as there were a year ago, but there is a fair amount nevertheless. Prices are higher than they were a year ago, however, and it is quite probable that the country has reached its extreme limit of consumption—an increase in 1881 of 1,000,000 gross tons over that of 1880. Hence it is becoming a matter of the greatest importance to retain the home market for home production. Last year, owing to the enormous consumption, foreign iron was taken without any apparent detriment, but the experience of 1882 may be very different. The change of feeling in regard to values may have some good effect, and will, doubtless, if it checks imports. What the ultimate outcome may be cannot be predicted at present, but there is reason for the caution with which the trade is at present characterized. The week's transactions have been very light, leading consumers, and in fact all classes, evincing a disposition to hold off for lower prices. Sellers are inclined to make moderate concessions, although there is very little iron offered for immediate delivery. For spring and summer deliveries, however, orders can be placed on decidedly better terms, although as yet there has not been enough done to fix prices definitely. There are sellers at \$24.50 at furnace for No. 1 Foundry; \$22.50 @ \$23 for No. 2, and \$22 @ \$22.50 for Gray Forge, furnace delivery. Certain brands are, of course, held at higher prices, but fair average Lehigh Irons can be had at the above rates, and possibly a little less in some cases. For small lots 50¢ to \$1 more is asked, but the market is in buyers' favor, so that quotations are somewhat elastic, and likely to be stretched far enough to take in good buyers, if their offers are at all reasonable.

Foreign Iron.—There is very little doing in Middleboro' Iron, although it is offered at \$21.50 @ \$22. The tendency is toward lower prices, and as several cargoes are afloat for the United States, and prospects of a further decline in freights, buyers are less inclined to make offers. Scotch iron has been pretty much all cleared up in this market, and the demand is of a purely retail character, at about \$25 @ \$26 for Gartsherrie and other good brands. Bessemer Pig is very much demoralized, and is offered for shipment at \$25 @ \$25.50. A sale of 10,000 tons was made at \$25, for summer shipment to New York, beyond which there appears to be nothing doing. There is very little disposition to make firm offers at present, and it is the general opinion that prices will have to be lower before consumers can be induced to take hold freely.

Muck Bars.—The market is irregular and feverish, with sales at prices varying from \$43 to \$45.50 at mill, according to quality. There are few sellers, and prices would be further shaded to good buyers. Bars made from Old Rails have been sold at \$42.50 @ \$43, while the refined article commands \$45 @ \$45.50.

Blooms.—Prices are unchanged, although, in view of advances in regard to "Swedes Bars," which have been used here rather freely, somewhat better prices are not improbable. The London correspondent of The Iron Age, under date of February 13, says: "The wonderfully mild winter has prevented the smelters from procuring their usual supplies of charcoal from the forests. It is pretty certain, therefore, that the production of Pig Iron, Blooms and Bars will be curtailed during the year 1882. Makers of Swedish Bars and other finished iron are busy, some of the larger works having orders sufficient to last until midsummer. Ordinary Swedish Pig is \$5; Nail Rods, \$10. 10¢ @ \$11; superior ditto, \$12; ordinary hammered and rolled Bar Iron, \$9. 5¢ @ \$10, all f. o. b. Gothenburg. The exports last year from that port reached 125,350 tons of Iron and Steel." Philadelphia prices for American Blooms are as follows: Charcoal Blooms, \$7; Run-out Anthracite, \$6.25 @ \$6.5; Swedish Blooms, \$5.5, and Northern Ore Blooms, \$5.0.

Bar Iron.—There is no change in the position as stated in our last, except that the feeling is somewhat depressed, owing to the unsettled state of affairs in financial centers. The continuous decline in securities is causing a feeling of uncertainty and distrust, extending far beyond the stock market. Then there are indications of labor troubles, which, if developed at a time like the present, may do irreparable injury. As regards the Bar trade alone, the prospect is fairly satisfactory. There is not a mill in the neighborhood, so far as we can learn, but is fully employed on legitimate business. There is a moderate inquiry, but not enough new business coming in to fully maintain the equilibrium. In other words, old contracts are being finished up, without being replaced to the same extent by new ones. It does not necessarily follow that there will be a scarcity of business later on. On the contrary, unless something serious and unforeseen occurs, renewed activity may be looked for at an early date. So far as we can learn, consumers are as busy as ever, and when purchases (represented by current deliveries) are exhausted, they must, of necessity, be in the market again. Still, it must be conceded that the position is not free from anxiety. It seems almost too much to hope that consumption can be maintained at its present extreme limit, while a very slight falling off would have a tendency to weaken prices and produce a most unwholesome competition. It is this which adds interest to the doings in the stock markets, which (whether they do or not) are supposed to reflect the condition of business generally, as shown by the earnings of the transport companies. A favorable change in this direction would probably help to start things again, and as the crop prospects are unusually promising, there is reason to hope the depression will be of short duration. Prices are steady at 2.8¢ from mill, and 3¢ from store, with demand sufficient to absorb almost everything as it comes to the market.

Structural Iron.—There is a fair business doing, but most of the work at mills is on old contracts. An order for 600 to 800 tons of Beams is to be given out to-day for the Public Buildings, but beyond this we have not heard of anything new. The shipyards are likely to be heavy consumers, and the outlook is considered quite encouraging. Beams have been advanced to 4¢, and Channels to 4.2¢, but, as a matter of fact, these have been the selling rates for some months past, so that the change is merely a nominal one. Angles are quoted 3.2¢, and Bridge Plates, 3.25¢ @ 3.40¢.

Plate and Tank Iron.—Prices show no improvement, although there has been rather more inquiry than for some time past. We have not heard of any large lots being definitely closed, but it is probable that something will be done in the course of the week. Prices are still inclined to drop, but a fair average of the market is about as follows: Tank Iron, 3.2¢ @ 3.3¢; Refined, 3.6¢ @ 3.75¢; Shell, 3.85¢ @ 4¢; Flange, 5¢ @ 5.25¢, and Firebox, 6¢ @ 6.25¢.

Sheet Iron.—There is a somewhat quieter feeling, but no change in general quotations. Possibly buyers of large lots for summer deliveries could obtain concessions, but, as a rule, quotations are about as follows: Common Sheet, No. 27 and 28, 5.5¢; Common Sheet, No. 26, 5.25¢; Common Sheet, No. 25, 5.0¢; Common Sheet, No. 24, 4.75¢; Best Refined 34 @ 35¢ advance on the above; Best Bloom Sheets, No. 26 to 28, 7¢; Best Bloom Sheets, No. 25 to 27, 6.5¢; Best Bloom Sheets, No. 24 to 26, 6.25¢; Common Red Plates, 3.16 to 3.18, 3.5¢; Blue Annealed, 3.16 to 3.18, 3.5¢ @ 3.6¢; Best Bloom Galvanized, discount, 3.5¢; Second quality, discount, 4.0¢.

Wrought Iron Pipe.—The demand has fallen off considerably, and it is understood that extra discounts can be obtained by heavy buyers. Boiler Tubes are quoted at 37½¢, and Gas and Steam Pipe 57½¢ discount from list price.

Steel Rails.—The feeling of weakness, which we have referred to in recent reports, seems to continue, and is somewhat increased by the demoralized condition of the market for railway securities. We have not heard of any transactions in rails during the week, but manufacturers claim that they have all they can do for the present, and under any circumstances would require \$55 @ \$56 for "deliveries at their option." Buyers are very timid, however, and, unless in actual need, are not inclined to place orders in the present condition of the market.

Iron Rails.—There is nothing doing except in small lots, which command \$48 @ \$52 at mill, according to location, weight of rail, size of order, &c.

Steel Blooms.—There has been some inquiry, but no sales have been made so far as we can learn. There are sellers for prompt shipment at \$45, duty paid, and one or two lots afloat are offered at about same figures.

Spikes.—The demand is fair, and sales have been made at \$3.10 @ \$3.15. Large lots could probably be had at somewhat lower figures.

Crop Ends.—There is very little demand, and it seems difficult to get offers for large lots. They are offered at about \$26.50, although it is understood that \$26 would be accepted if promptly bid.

Old Rails.—The market is about the same as last week. Lots of 200 to 300 tons each are placed at \$30 @ \$30.25, but it would be difficult to get \$29 bid, for shipments. Buyers are very cautious, and the market would quickly give way under increased offerings. Double Heads would bring about \$31 for lots of a few hundred tons each.

Scrap Iron.—The market is dull, and prices are a shade easier, although the offerings are not large. Choice No. 1 commands \$32 @ \$34; Cast, \$20 @ \$21.

Nails.—Are steady and unchanged, at \$3.40 net.

Lloyd & Lindsay have recently opened an office at 328 Walnut street. Both members of the firm are from Wilmington, Del., Mr. Lindsay having been for many years with the Harlan & Hollingsworth Company, of that place, but more recently with one of the leading Iron firms of Philadelphia. They have an excellent busi-

ness connection, and will doubtless secure a good position in the specialties they propose to handle.

PITTSBURGH.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., March 7, 1882.

General business continues to move along, as a rule, satisfactorily, with every indication of a good spring trade, which will open up just as soon as the weather becomes settled, and the country roads, which are in a very bad condition, become passable. The trouble at the Pittsburgh Bessemer Steel Works has assumed a serious aspect, and, as apprehended, it has resulted in bringing out the Amalgamated Iron Association on one side and the Iron manufacturers on the other. The proprietors of the mill in question, it would appear, are making an effort to cut loose from the Amalgamated Iron Association, or, in other words, they want to be at liberty to run their own works in their own way; to hire and discharge whomsoever they please, independent of the Amalgamated Association. Fears of a conflict between the union and non-union men have been entertained for some days past, but the indications at the present writing are that these fears will not be realized. The Amalgamated Association is pledged to maintain the peace, to discourage anything looking to forcible measures on the part of its members, and it is hoped and expected that the trouble will soon be brought to a satisfactory termination. A general strike at this time, just as the spring trade is about to open up, would be a very serious matter to Pittsburgh, and it is sincerely hoped that we will be spared from anything of the kind.

Pig Iron.—There has been an increasing volume of business the past week, although the market cannot by any means be termed active. In addition to an increased number of small sales, we hear of several round-lot sales having been effected, and while the terms of the latter have been withheld for the present, it is said that full prices were obtained. Consumers generally appear to be impressed with the belief that the market is easier, and many of them are holding back in expectation of being able to buy at a decline, but furnacemen, as a rule, do not appear to be alarmed. They point to the continued large consumption, every available puddling furnace being employed, as well as to the comparatively small supply in first hands, and predict that an advance is more likely than a decline. It is contended that, at present prices, the margin for profit is small, and that there is no chance to reduce cost of production; that coal, coke, ore and labor are all tending upward, and that there is no good reason, therefore, why Pig Iron should go back. Stocks in the Shenango and Mahoning valleys are reported as being very much reduced, and, besides, furnacemen there say they can do better in markets West of there than in Pittsburgh, and then the recent advance in freights has added to the lay-down cost of Eastern Irons in this market. Good Neutral Mill Irons are still quotable at \$25.50 @ \$26, 4 mos.; all-ore ditto at \$27 @ \$28; Bessemer ditto at \$28.50 @ \$29; Foundry grades, \$26 @ \$28, with fancy brands at \$28.50 @ \$29. Sale of 1000 tons (native ore) Forge at \$25.50, 4 mos., and 100 tons of same kind at \$25.50, cash.

Muck Bar.—The market continues slow, with more offering apparently than is wanted, and we hear of offers to sell at \$45, cash, for a good neutral, although we quote at \$45 @ \$45.50.

Manufactured Iron.—There is nothing particularly new to report. While new orders are not as numerous, possibly, as they were at the opening of the year, the mills have all they can do, and the prospect is considered very promising for a good spring trade. Prices firm at full card rates. Bars, 2.50¢; Sheet No. 24, 4.30¢; Tank, 3.30¢; Boiler Plate, 5.1¢ @ 7.1¢, according to brand and tensile strength. Skelp Iron has been offish and dull for some time past, but an increased business is expected within the next week or two, as the pipe trade will soon open up.

Nails.—There is a very fair and increasing business. Reports from all points of production report light stocks, and orders coming forward more freely. Wheeling is reported as having orders for three to four weeks' production, and the factories here, there is reason to believe, are in about the same condition. Prices unchanged: \$3.40, 60 days, with the usual abatement of 10¢ per keg on carload lots and upward, 2¢ off for cash. The regular monthly meeting of the association takes place to-morrow, but there is not likely to be anything done of importance.

Wrought Iron Pipe.—Business has been comparatively light for some weeks past, as it always is at this season of the year, but with the advent of fine weather, so that out-door work can be fully resumed, the demand will soon pick up; in the meantime manufacturers are busily engaged in working up an assorted stock. No change in prices; discounts on Gas and Steam Pipe, 60 @ 60 and 5¢; Boiler Tubes, 40 @ 40 and 5¢; Oil-well Casing has been reduced to 75¢ per foot, net, while Tubing remains unchanged at 25¢.

Steel.—There is a good demand for nearly all kinds of Merchant Steel, and, as in the case of Iron, manufacturers are refusing to make any large contracts for future delivery. Prices firm, but unchanged. Best quality refined Cast Steel, 3/4 to 2 inch inclusive, 12¢; ditto Crucible Machinery, 8¢; Open-hearth and

main in a peculiarly dull, and, we may say, in a curious condition, bearing in mind all we were told a very short time ago as to the strength of the then situation and the exceeding brightness of the outlook. It is alleged by some that the recent drop in tin accounts for the weakness of tin plates, but I fail to perceive the parity of the reasoning, seeing that tin is nominally but a few pounds less in value per ton than it was a few months ago, with every likelihood of jumping up to £120 within the next three months. Nor has there been a decrease in the values of sheet iron or the other raw materials of the industry. To get at the true reasons of the new weakness I fancy we must pursue our investigations at Liverpool, where the brokers and shippers boast that they hold the tin-plate trade within the hollows of their hands. In reality their boast is not so bumptious as may appear superficially, for these gentlemen have controlled the business most thoroughly and most ably can-

not be denied. That they will continue to do so is very probable, so long as the makers are content to ship via Liverpool instead of direct from the Bristol Channel, as some of the wiser of them have of late been doing. As a trade there is not another in the entire world which ought to be in a better and stronger position than this industry. There are not eighty firms engaged in it throughout Great Britain. The foreign and American competition is insignificant, and is of no account in fixing or regulating selling quotations. Despite these advantages the business is more generally disorganized than the contrary, and quotations are influenced more by the Liverpool merchants and brokers than by the manufacturers themselves. Whether the system of "private" brands is chiefly to blame or not, I do not undertake to affirm. My own opinion is that the makers, as a whole, are guilty of the most egregious folly in permitting their interests to be controlled by outside parties. They make plates and brand them with marks which are devoid of meaning to themselves. They know nothing of the destinations of these plates, or the purposes for which they are to be used. Sometimes the brand is one thing; sometimes another, the goods being in no wise altered. The producer then offends the merchant; he goes to another mill and gets his "private" brand—the same mark—placed upon an entirely different article. Cokes are just cokes, and no more; charcoal is one thing, and no more; the other! How any class of manufacturers can hope to succeed, or to know what they are doing, passes all comprehension! As a matter of fact, the makers don't know where they are, and scarcely who they are for a consecutive month, and their business, instead of being a placid and remunerative ring, as it were, is an open preserve (if such a thing can exist) which is poached upon most mercilessly and unceasingly. The direct shipments from Cardiff and Bristol to New York, &c., represent an effort to evade the Liverpool men, but it has not yet been attended with conspicuous success, many of the lots having been thus sent to the orders of Liverpool buyers. Among current figures I note: At Liverpool, best charcoal, I. C., 22/24; second charcoal, 21/22; best cokes, 19/10; second cokes, 18/6; 10/10; and common cokes, 17/18; all less the usual 3% for cash; "Pilot" best charcoal, 22/6 f. o. b. London; C. W. M. best coke, I. C., 19/6 ditto; M. F. best charcoal, I. C., 26/; "Crown Talbot" charcoal, 22/6; ditto best coke, 21/6; and R. K. P., 19/6, all f. o. b. London, and less 3% for cash. Nothing further has been heard of the "restriction of production" proposal.

SCOTCH PIG IRON

is dull, but has a tendency to recover under the influence of easier money, rather lower freights, and the proposal to continue the limitation of the output. Warrants are now about 49/1. In Connal's stores there are 630,805 tons (a decrease of 250 tons on the week) against 523,862 this date year. The furnaces blowing number 106 (including nine on hematites) against 121 a year ago. Shipments to date this year have increased by 3795 tons, and imports from Cleveland have grown by 11,271 tons. Writing from Glasgow, February 18, James Watson & Co. said: "There is no change in the position of the Scotch iron market, only a limited business being transacted in warrants and makers' iron. On Monday the price of warrants advanced from 48/10 to 49/1, receding at the close to 48/11 1/2. On Tuesday the market was steady, with transactions between 49/1 1/2 and 48/11, cash. On Wednesday the price improved from 49/1 to 49/6, cash, closing at 49/3 1/2. Yesterday forenoon business was done from 49/4 to 49/7, cash, receding in the afternoon to 49/4 1/2. To-day the market was flat, a large business being done between 49/5 1/2 and 48/11 1/2, closing sellers at 49/1 1/2. The shipments last week were 10,780 tons, as compared with 10,072 tons for the corresponding week of last year." We quote:

| G. M. B., at Glasgow | No. 1. | No. 2. |
|--------------------------|--------|--------|
| Coltness | 50/ | 47/6 |
| Langloan | 50/ | 47/6 |
| Gartbarrie, at Glasgow | 50/ | 47/6 |
| Bannockburn | 50/ | 47/6 |
| Calder | 50/ | 47/6 |
| Carbroe | 50/ | 47/6 |
| Glenasmole, at Ardrossan | 50/ | 47/6 |
| Edlington | 50/ | 47/6 |
| Dumfries | 50/ | 47/6 |
| Rhodes, at Leith | 50/ | 47/6 |
| Kimble, at Grangemouth | 50/ | 47/6 |
| Carron, at Grangemouth | 50/ | 47/6 |

CLEVELAND PIG IRON

is quiet, on the basis of 4/9 for No. 3 prompt and 42/6 forward to May. The local consumption is very large, and shipments are improving, as they are pretty certain to do as soon as the Baltic and other northern navigations are free from ice. Some curiosity having been aroused by the absence hitherto of the auction sales recently announced by B. Samuelson & Co., I may state that the firm adheres to their original intention, and will offer some pig iron in that manner as soon as the market assumes a more settled condition. Current figures for Middlesbrough G. M. B., net cash in Tees:

| No. 1 Foundry | 46/ | Mottled | 41/ |
|---------------|------|---------------|------|
| " " | 44/6 | White | 40/6 |
| " " | 42/6 | Refined Metal | 60/ |
| " " | 42/6 | Kentledge | 43/ |
| " " | 42/6 | Forge | 41/6 |

Estons continues very busy on rails, blooms, &c. Another cargo of blooms, and possibly some pig iron, will leave for the United States this week.

WEST COAST HEMATITES

remain steadily quiet, the large shipments being discounted by offers by merchants at prices which are, in some instances 2 to 3/4 under maker's own quotations. Mixed numbers are said to have been sold by these second holders at 59/ and 59/6, but the average rate for ordinary parcels of Nos. 1, 2 and 3 Bessemer is 60/ @ 61/. There are sixty-eight blast furnaces in and thirteen out of blast. The shipments last week were 17,272 tons of pig iron and 204 tons of rails. Ores are still at 15/ @ 18/, and Spanish 17/ ex ship. Prices of hematites:

| Cleator | No. 1. | No. 2. | No. 3. |
|-------------------|--------|--------|--------|
| 1/2 ton | 57/ | 56/ | 55/0 |
| 1/2 ton | 57/ | 56/ | 55/0 |
| Worthington | 57/ | 56/ | 55/0 |
| Wals (Cumberland) | 57/ | 56/ | 55/0 |
| 1/2 ton | 57/ | 56/ | 55/0 |
| Moss Bay | 57/ | 56/ | 55/0 |

| | | | |
|------------|------|------|------|
| Distington | 61/6 | 60/6 | 59/6 |
| Harrington | 61/6 | 60/6 | 59/6 |
| Solway | 61/6 | 60/6 | 59/6 |
| Maryport | 61/6 | 60/6 | 59/6 |

LIMITED COMPANIES' REPORTS

are being issued for the year, or half year, as the case may be, and some of them afford evidence of the vastly improved state of affairs during the last six months. Joseph Rodgers & Sons, Sheffield, pay the usual annual dividend of 17 1/2 per cent. to their thirty-five or forty shareholders. The Patent Nut and Bolt Company, Birmingham, have made a net profit of £37,784 on the year, yielding 10 per cent., and raising the reserve fund to £110. John Round & Son, electro-platers, Sheffield, pay 12 1/2 per cent. The Midland Iron Company, near Sheffield, have made a profit of £5049, yielding 7 1/2 per cent., and providing for certain contingencies. Perry & Company, Birmingham, have cleared £24,762, paying 8 1/2 per cent. for the year. The liquidators of the Darlington Iron Company have cleared £16,431 in ten months, and speak hopefully of prospects, although the losses to date have been £105,988, and the liabilities total £457,310.

FOREIGN.

FRANCE.

(Monteur des Interests Metalls.)
PARIS, Feb. 21, 1882.—Metals.—Business recovers fast from the late scare, and metals are partially a little better and in part lower. We quote Copper: Chili Bars, 175.50 @ 175.75; 100 kg. 175.50; Ingots and Slabs, 185.50; Best Selected, 187.50; and pure Corocoro Ore, 175.50 an advance of 5 francs. Tin: Banca declined 2.50 francs, and is now worth 300 francs. Biliton remains 258.75; and Straits and Australian, 257.50; Lead gave way 750.50 to 750 francs; we quote the same, 36 @ 37.25. Spelter advanced to 46.75 at Havre; it remains 46.50 here. Iron.—Nothing very striking has occurred. During the past fortnight only a moderate business has been transacted; the demand being limited to structural iron. All railway material, meanwhile, begins to be more and more lively, and the spring season promises well on the whole. We quote at Paris: Merchant Iron, 21 francs; special Iron, 22 francs; large plates, 23.50 @ 24; common Sheets, 28.50 @ 29, as a basis. Wire Nails are in good request at 37 francs at the depots of Paris and 38 in store for export. Wire Nails, delivered at Marseilles, at 39 @ 40 for No. 15. At the Valenciennes meeting of rolling mill owners prices have been fixed, delivered at the works, at 19.50 for Merchant Iron; Corners and Flooring, 20.50; large plates, 22.50; and Sheet Iron No. 2 at 20.50. The demand in that quarter has been steadily on the increase. At Longwy stocks of Pig have been exhausted, and Gray Pig has, from 7.20, been advanced to 7.50 francs. The general outlook in the iron trade throughout France is highly encouraging, causing rolling mill people at the North to advance the basis for Merchant Iron to 19 francs. Coal.—While the mild winter has led to great disappointment as regards the demand for domestic requirements, like, for example, in point of activity, compensated for it. The Pas de Calais and North together produced last year only 7,986,349 tons of Coal, against 8,545,012 in 1880.

BELGIUM.

(Revue Universelle.)

BRUSSELS, Feb. 21, 1882.—Iron.—Our market is more sensitive than either the French or German market, thus at first the late financial disturbance seemed to have no effect whatever, but now, upon a more close appreciation, a somewhat different view is taken of the situation in France. People here have their grave doubts as to whether public works will in reality be pushed with as much energy in France as we are still assured they will be for the raising of funds without a fresh loan will not be an easy matter, and, aside from this consideration, the panic has paralyzed certain banks and enterprises which were preparing a large demand for railroad material. Like, for example, the Servian railways, the building of which is interrupted through the Bontoux group's breakdown. On the other hand, we are told from France that capital will be poured into a considerable extent the stock exchanges and revert all the more abundantly to industrial undertakings, and public as well as private works all over the Continent, and that the iron trade will, above all, be benefited thereby. But however true this may be, people in the Iron and Steel trades in this country are at any rate less sanguine and more cautious, for they depend very much on an uninterrupted flourishing state of France, and are still assured for the moment our works are still well provided with orders. Prices are, in the meantime, firmly sustained among us. We quote Pig Iron, 7 francs; Merchant No. 1, 14.50; with 1 franc difference between numbers 1 and 2; No. 3, 12.50; No. 4, 10.50; Steel Rails, 18; Hoops, 23.50; Axes, 25. We hear that the Russian Government is again about to raise the Iron and Steel duties sufficiently to produce 4,000,000 roubles more revenue. Metals are steady. We quote Copper, 177; Tin, 295 @ 298; Antimony, 135; Spelter, 44; Sheet Zinc, 50.50; Lead, 36.50; and Phosphor Bronze for bearings, 29; ditto Wire, 375 @ 450. Coal remains firm.

GERMANY.

(Borsenhalles.)

HAMBURG, Feb. 21, 1882.—Iron.—Our Dortmund correspondent reports under yesterday's date: "The iron trade here has maintained its favorable aspect; the blast furnaces not only in the Rhenish-Westphalia district, but in Siegen and Nassau have sold their output for a long time ahead, although during a couple of days it looked as though the price of Pig would suffer a slight break. In the rolling mill branch the tendency is a very firm one; most of the works have secured orders for a couple of months to come. Large orders have to be filled in Rod, Iron, Rolled Wire and Course sheets. In this sheet trade a little doing. The Bessemer and Thomas Steel Works are well furnished with orders to date. Steel Rails were tendered at Berlin at equal to 175 @ 176 marks 1/2 ton at the works, which is a little less; very large lines might, possibly, still be obtainable at 165 @ 170. A fair business boiler makers report, as well as machinists, foundries, screw manufacturers and other hardware people. Bridge builders continue to form an exception, for as a general thing there is little prospect of an increased activity under this head. A few of these concerns are occasionally in receipt of jobs of minor importance. I quote: Gray Pig, No. 1, 72 marks; Dortmund Foundry Pig, No. 1, 77; No. 2, 72; ditto, No. 3, 67 marks; Luxembourg Pudding and Thomas Pig, 60 @ 65 francs; Rod Iron, 145 marks; Prime Coarse Sheets, 225 @ 225; second quality and thin, 210 @ 215; Iron Rails, for mines, 145; ditto, Steel, 150 @ 155 at the works. Coal unchanged; the demand for industrial is active, for household Coal slack. In the Moselle and Sauer region, both Pig Iron and Finished move off well, including sleepers for railways. Coal is doing well; the Government Sauer mines turned out in January 423,385 tons, being 25,305 tons more than in January, 1881. In Upper Silesia there is a well-sustained market, and great animation in Pudding Pig, Merchant Iron and Sheets. Coal leaves much to be wished for in that province. Metals inactive. Lead is unaltered; English Pig, 17 @ 17.50; German, 15.50 @ 16; Spanish, 18.50 @ 19.50; Copper is weak; Chilean, 210 @ 215; English Refined, 75 @ 75.50. Tin is quiet at 118 @ 124. Nothing transpires in Spelter, worth 18.25 @ 18.50.

HOLLAND.

(Kook & Vlierboom.)

ROTTERDAM, Feb. 14, 1882.—Tin.—Has been duller since our last report, receding to 55.50 gold-ryls. Banca and Billarri spot, 55.50 arrive, 55.75. Peto 16.—Since the foregoing was written, both kinds dropped to 57 spot, and 57.50 to arrive, in sympathy with London advices. Feb. 21.—Tin has recovered by 4-degrees, and at present both sorts command 59 on the spot and 60.50 at 100; at 50 below these rates some business would result.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, Feb. 21, 1882.—Iron.—Iron industry continues in a firm but not active condition among us, but we

do not expect any material changes in the near future. The financial strain has only temporarily affected Pig Iron and Old Rails; Merchant Iron and Steel Rails were not influenced by it. The new duties will compare with the old ones as under:

| | Florins per 100 kg. New duty. | Florins per 100 kg. Old duty. |
|-------------------------------------|-------------------------------|-------------------------------|
| Pig Iron | 1.60 | 1.50 |
| Iron and Steel in Rods | 2.75 | 2.50 |
| Sheet Iron and Wire, 1 mm. and over | 4.00 | 4.00 |
| Ditto, ditto, under 1 mm. | 2.00 | 1.50 |
| Coarse Iron Castings | 2.00 | 1.50 |
| Ditto, filed on edges | 8.00 | 8.00 |
| Coarse hardware | 4.00 | 2.50 @ 4.00 |
| " japanned | 5.00 | 4.00 |
| " polished | 5.00 | 4.00 |
| Wrought tubes | 5.00 | 2.10 |
| " boilers | 6.00 | 4.00 |
| Fine hardware and cutlery | 15.00 | 4.00 @ 12.00 |
| Firearms and Needles | 50.00 | 30.00 |
| Locomotives | 8.00 | 1.20 |
| Tenders | 6.00 | 4.00 |
| Sewing machines | 20.00 | 2.70 |
| Machinery | 10.00 | 8.00 |
| Jewelry | 200.00 | 200.00 |

CHILI.

(Weber & Co.)

VALPARAISO, Dec. 31, 1881.—Copper.—Since we last reported, on December 9th, the market opened with buyers at \$18.60 on shore, but since then, on receipt of better cable advices from England, Urmeneta advanced to \$19.55 on board, and the special brand Vicuña to \$19.75; toward the close the market began to flag, closing at \$19.40; sales sum up 28,677 quintals. Nitrate.—The liberal November and December shipments from the Coast having depressed foreign markets, we have sympathized therewith, causing a break to \$2.90 for 60% with 1 1/2% salt, for the United States, and a further reduction will have to take place ere anything can be attempted for European account. Sales sum up 477,000 quintals at \$2.70 for 95% salt. Smelting Coal.—Has been made to the extent of 10,000 tons for Europe and 7500 for the United States. A decree has passed Parliament reducing the export duty at Aguas Blancas to one-half the previous rate, causing manufacturers to be resumed at that point. As Taital does not participate in this privilege, manufacture, at present low prices, will, in all likelihood, be curtailed there. Coal is excessively dull, holders being obliged to sell below cost of importation at 26 1/2; Smelting Coal is better situated, 32/6 being paid for it. Exchange.—has risen to 36 1/4 d. for private bills, 90 days, London.

EAST INDIES.

(Hosseuer & Co.)

COLOMBO, Jan. 21, 1882.—Plumbago.—Although business has been quieter, dealers show considerable firmness. We quote in rupees, 1/2 ton: Fine Lump, 130 @ 150; Ordinary ditto, 125 @ 140; Chips, 75 @ 80; and Dust, 20 @ 25. Shipments to the United States from October 1 to January 19 have been 39,587 cwt.; to England, 31,130; and to Australia, 104; total, 72,830 cwt., against 31,647 in 1881; 25,588 in 1880; and 24,185 in 1879. Exchange.—Six months' private bills, 1/6 1/2.

SCIENTIFIC AND TECHNICAL.

Prof. Ball, of England, in a recent lecture gave the following interesting account of

PREHISTORIC TIDES.

At present the moon is 240,000 miles away, but there was a time when the moon was only one-sixth part of this, or, say, 40,000 miles away. That time must have corresponded to some geological epoch. It may have been earlier than the time when Eozoon lived. It is more likely to have been later. I want to point out that when the moon was only 40,000 miles away, we had in it a geological engine of transcendent power. If the present tides be 3 feet, and if the early tides be 216 times their present amount, then it is plain that the ancient tides must have been 648 feet. There can be no doubt that in ancient times tides of this amount, and even tides very much larger must have occurred. I ask the geologists to take account of these facts, and to consider the effect—a tidal rise and fall of 648 feet every day. Dwell for one moment on the sublime spectacle of a tide 648 feet high, and see what an agent it would be for the performance of geological work! We are now standing, I suppose, some 500 feet above the level of the sea. The sea is a good many miles from Birmingham, yet if the rise and fall at the coasts were 648 feet, Birmingham might be as great a seaport as Liverpool. Three-quarters tide would bring the sea into the streets of Birmingham. At high tide there would be about 150 feet of blue water over our heads. Every house would be covered, and the tops of a few chimneys would alone indicate the site of the town. In a few hours more the whole of this vast flood would have retreated. Not only would it leave England high and dry, but probably the Straits of Dover would be drained, and perhaps even Ireland would, in a literal sense, become a member of the United Kingdom. A few hours pass, and the whole of England is again inundated, but only again to be abandoned.

These mighty tides are the gift which astronomers have now made to the working machinery of the geologist. They constitute an engine of terrific power to aid in the great work of geology. In the great primeval tides will probably be found the explanation of what has long been a reproach to geology. The early Palaeozoic rocks form a stupendous mass of ocean-made beds, which, according to Prof. Williamson, are 20 miles thick up to the top of the Silurian beds. It has long been a difficulty to conceive how such a gigantic quantity of material could have been ground up and deposited at the bottom of the sea. The geologists said: "The rivers and other agents of the present day will do it if you give them time enough." But, unfortunately, the mathematicians and the natural philosophers would not give them time enough, and they ordered the geologists to "hurry up their phenomena." The mathematicians had other reasons for believing that the earth could not have been so old as the geologists demanded. Now, however, the mathematicians have discovered the new and stupendous tidal grinding engine. With this powerful aid the geologists can get through this work in a reasonable period of time, and the geologists and the mathematicians may be reconciled.

Among the papers read at a recent meeting of the North of England Institute of Mining and Mechanical Engineers, was one by Mr. J. W. Swan on

AN ELECTRIC SAFETY LAMP.

with portable secondary battery. The lamp, which is calculated to give a light equal to that of two or three candles, is so attached to the conducting wires that good contact is established, and that the renewal of the lamp may be effected with great ease. The lantern shown was compact and light, and consisted of but few parts of a simple and

inexpensive character. In connection with the lamp was the striking novelty of a portable electricity-generating apparatus in the nature of a secondary battery, contained in a small wooden box, which rendered the safety lamp independent of main wires conveying current from a distant dynamo-electric machine. The dynamo-electric machine would still be required, for what was contemplated was that the portable secondary cells contained in the box should be taken to the dynamo to be charged by its action, and that, after being so charged, these portable stores of energy should be sent into the pit workings on trucks, there to be connected with lamps. A set of cells as exhibited would keep the lamps lighted for over an hour; probably a set weighing about twenty pounds would keep it lighted for eight hours. The actual cost of supplying the current and keeping the lamp lighted would be very small, probably less than the cost of oil for producing an equal amount of light by means of the ordinary pit lamps. The most serious cost would be for plant—for the dynamo and engine, for the boxes of cells, and for the labor in transporting them to and from the place where they were used. It is possible, however, that the store cells may be improved so as to render them less bulky and heavy and less costly.

Mr. Stephen Cliff, of Wortley, Leeds, England, has recently suggested a process by which the

SEPARATION OF LIME AND MAGNESIA CONTAINED IN DOLOMITE

may be easily effected, employing for this purpose the difference in the specific gravities of the salts or combinations of lime and of magnesium. In carrying the invention into effect Mr. Cliff uses either calcined or uncalcined dolomite, as may be desired, adding thereto sulphuric acid, any natural sulphate or sulphide, or any chemically or artificially produced sulphate or sulphide, in such proportions that the sulphuric acid or that contained in the sulphate shall be sufficient to combine only with the lime present in the calcined or uncalcined dolomite. By this operation sulphate or sulphide of calcium is formed, as the case may be. The specific gravity of magnesium being greater than that of sulphate or sulphide of lime, the magnesium falls down first, and the sulphate or sulphide of lime (calcium) afterward. The sulphate or sulphide of lime is then removed by any suitable means, either mechanically or by decantation. When uncalcined dolomite is used the magnesium will be precipitated as a carbonate. As the magnesium will probably not be free from sulphate or sulphide of lime, it may be again washed and allowed to resettle as often as may be considered desirable. If desired, sulphurous acid or sulphurous compounds may be used in lieu of sulphuric acid. In this case the magnesium will fall as in the first, but the lime will be in the form of a solution, which may be afterward used or treated, as may be required.

An addition to the existing number of laundry appliances has lately been made by Messrs. Tapham & Snaith, of Birmingham, England, in the shape of

A "UNIVERSAL" WASHER,

which is claimed to be one of the cheapest and most perfect yet invented. It consists simply of a strong, thick, taper tube, rising from the center of a metal shield, with the convex side uppermost. The edges of the shield are of such shape as to allow the free passage of the water under it, and the top of the tube is fitted with a cap or disk, raised sufficiently above the mouth to permit the escape of the water. When the washer is placed in the boiler, the water, as it becomes heated, rises up in the tube until it encounters the tap at the top, which forces it back into the boiler in a continuous spray fountain, somewhat in the shape of an expanded umbrella. A continuous movement of boiling water is thus kept up, and the clothes are washed much more effectively and expeditiously than by hand labor.

In consequence of the great danger to which workmen using circular saws are constantly exposed, it has been proposed to use

A SELF-ACTING SAFETY SHIELD,

the descending or front part of the saw being automatically protected, so as to prevent anything from coming into contact with it until the shield is temporarily removed. The latter is also extended, in order to cover the back or ascending part of the saw, preventing anything from coming into contact with it at that point. The shield is made of a plate of iron or steel, of about the thickness of the saw, and is of sufficient breadth to give the proper rigidity. It is placed at a given distance from the teeth of the saw, and is provided with movable plates and adjustment slide and screw, to suit the alterations in the diameter of the saw by wear, or the substitution of smaller for larger saws. The shield is attached to an arm hung upon a stud concentric with the saw mandrel, and is balanced by a counterpoise under the table. The semi-circular shield is about 1 1/2 inches deep and the same thickness as the saw. The forward end is so formed that the piece of timber to be cut rises the shield, but the latter rests upon the timber and forms an effectual guard, which prevents the workman from bringing his hands into contact with the cutting edge of the saw. As soon as the timber has passed from the saw, the shield returns to its original position, entirely covering the saw, and remaining so until raised by the next piece of timber.

Among the large number of interesting electrical novelties at the Paris Electrical Exhibition was one termed

L'ETINCELLE,

which promises to be a useful domestic appliance. It is a small dynamo electric machine, which can be used for lighting lamps of oil or benzoline and gas jets, as well as exciting the primary of an induction coil for medical purposes, or ringing an electric bell, and stimulating a Geissler tube. For lighting purposes it has a decided advantage over the apparatus of the same kind which employ some sort of voltaic battery. It is more durable, besides being more easily manipulated. The instrument consists of a permanent magnet with coils of wire round its poles, and a Siemens armature rotated between them by means of a handle and toothed wheels. The currents generated in the armature are sent by a Clarke's commutator round the coils, so as to intensify the

power of the magnet. The rotation of the handle produces breaks in the circuit, and the extra currents give rise to sparks which readily light a gas jet or oil lamp. The same apparatus slightly modified would serve to explode the mixture of gas and air in a gas engine.

M. Herin has recently made a series of experiments which lead him to the conclusion that the

RESISTANCE OF A GAS TO THE MOTION OF A SOLID BODY

does not vary with the temperature, provided the density is maintained constant. He states that the pressure and temperature of gases are not constituted by motion of atoms. His experiments were made with an apparatus consisting chiefly of a pendulum having a rectangular glass plate in a large globular glass vessel, the pendulum being suspended by a steel wire which passed through an india-rubber stopper, and the temperatures employed ranged between 11° and 50°. M. Herin's results do not seem to be accepted by a number of scientists, since these results necessitate a disavowal of some of the ideas upon which the kinetic theory of gases is based.

At the late Frankfurt Exhibition, Mr. Joseph Patrick obtained a bronze medal for his

STEAM-CYLINDER LUBRICATOR,

which is especially interesting, as its action depends upon a new application of the unequal expansion of two metals, or, correctly speaking, alloys. The lubricator consists of a gun-metal cup containing a second cup, also of gun-metal, held by a conical ring. The latter is provided with a number of small holes in order to afford communication between the inside of the second cup and the annular space between the two cups, thus equalizing the pressure or vacuum, as the case may be. The two cups are held together by a cover screwed on the outer one, this cover being provided with an air-tight compartment in order to prevent condensation in case the lubricators are exposed to the cold as in locomotives. The bottom of the inner cup is provided with a conical hole closed by a steel plug which will rise from its seat as soon as steam is admitted, the gun-metal expanding in a greater degree than the steel. A passage for the oil is thus afforded, varying in size according to the temperature of the steam. When the apparatus cools, the plug again closes the orifice, thus preventing all waste of oil when the engine is not at work. In case the hole should become stopped, the steel plug will force out the foreign substance as soon as the metals contract. As an additional precaution, a strainer is placed near the bottom of the cup, to prevent impurities entering with the oil. The lubricator cannot freeze while in action, even in the coldest weather, as the space between the two cups is filled with steam. If the flow of oil be too small, the plug should be slightly screwed upward; and if too large it should be screwed downward. This can be done with an ordinary turncrew, if necessary while the engine is running, and oil may be supplied at any time. The great advantages of this lubricator are that the consumption of oil can be regulated to a nicety; it operates without condensation, wick, springs, valves or taps; and there are no working parts to wear out, or fine holes to become stopped.

Mr. Boas recently described a number of experiments on

THE COLOR OF WATER,

some of which were qualitative, sunlight being sent through water in a zinc tube about 46 feet long, closed with glass plates. Distilled water thus gave a fine deep blue-green color; the red was quite gone, the yellow feeble, while the maximum brightness was in the green. Water of the Kiel supply, Germany, let no light through the length of the tube stated; with half the length it appeared deep orange; blue and green faded. In his quantitative experiments, Mr. Boas illuminated two screens with the same light source, before which was placed red glass, or sulphate of copper solution. The light from one screen went through water in a tube; that from the other along the tube outside. Both beams were brought into a position for comparison by means of total-reflection prisms; the screens were shifted till equal brightness was reached, and from their position the coefficients of absorption could be approximately inferred.

At a recent meeting of the Chemical Society, England, Messrs. C. F. Cross and E. J. Bevan read a paper on

A NEW APPARATUS FOR THE DETERMINATION OF MELTING POINTS OF BODIES,

the apparatus consisting of a small platform of thin ferrottype iron or silver, having an opening for the reception of a thermometer bulb and a small indentation or depression. A small quantity of the substance, whose melting point is to be determined, is fused in this depression, and while still liquid a thin platinum wire bent like an L, fused into a glass float, is immersed in the liquid and held there until the substance solidifies. A thermometer is then inserted in the opening and the whole apparatus plunged under mercury; the mercury is gently heated and the thermometer is carefully watched. As soon as the substance melts the float rises instantly and the temperature is noted. Stirring is unnecessary; the whole of the substance is surrounded with mercury, and the attention can be concentrated on the thermometer.

THE AMERICAN

VENTILATING SASH LOCK,

C. E. STELLER'S PATENTS.

A secure lock for sash, admitting a thorough ventilation of rooms. For sale in all Hardware Stores. Address

RACINE HARDWARE MFG. CO.,

Racine, Wis., Sole Manufacturers.

H.B. SMITH MACHINE CO.

923 MARKET ST.

PHILADELPHIA

CELEBRATED

WOOD WORKING

MACHINERY

For Car Shops, Planing Mills, &c.



BIT BRACES FOR 1882.

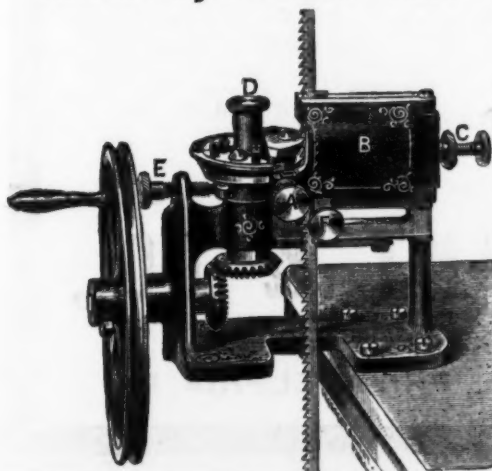
After having made almost every kind of a Bit Brace and tried them on the market, we find that our BARBER IMPROVED BRACE, as seen in this Cut, is the only one which gives universal satisfaction. During the past six months we have made some slight changes on this Brace, which remove all objections to it and make it absolutely perfect. We are aware that other Braces are sold at a less price, but they are also made at a less cost. Everything which goes into the Barber Brace is of the best and most expensive quality, and one of them will outlast six of any other kind. The Sweeps and Jaws are of steel, the Head of lignumvite and Revolving Handle of rosewood. It is highly polished and heavily nickel plated. The Jaws will hold, without any fitting, Tool Shanks of every shape, including Round Twist Drills. When furnished with the Ratchet Attachment, for boring in places where the Sweep cannot be revolved, it is the only Brace which will answer that purpose. We have not changed the price for many years, and do not anticipate any change in the near future; but from year to year we have been adding to the quality so as to make the cost to us double what it was ten years ago. We have recently added to our manufacturing facilities, and are now prepared to supply the world with Braces.

LIST PRICES.

| | |
|---|--|
| No. 10—14-inch Sweep, per dozen...\$33.00 | No. 14—6-inch Sweep, per dozen...\$21.00 |
| No. 11—12-inch Sweep, per dozen... 30.00 | No. 31—12-inch Sweep, per dozen... 39.00 |
| No. 12—10-inch Sweep, per dozen... 27.00 | No. 32—10-inch Sweep, per dozen... 36.00 |
| No. 13—8-inch Sweep, per dozen... 24.00 | No. 33—8-inch Sweep, per dozen... 33.00 |

MILLERS FALLS CO., 74 Chambers St., New York.

Amesbury's Band Saw Filing Machine.



Will Save Its Cost in a Few Weeks.

Any boy that can turn a crank can file a band saw in from five to ten minutes more accurately than an expert filer can do the same by hand in one hour. Keeps the teeth even and level, and enables the saw to do more and better work with much less strain. Pronounced by users to be the best labor-saving machine ever introduced.

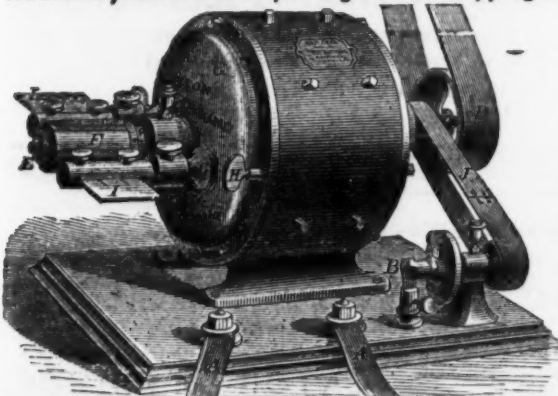
First Premium and Diploma of St. Louis Agricultural and Mechanical Association, 1881, awarded for

BEST BAND SAW FILING MACHINE.

Is sold at a price within the reach of every one using a band saw. Reduced Price List.—Net price, including 20 files, \$32; thin, corner and facing files, per dozen, \$1.20; thick beveled files, per dozen, \$1.50. Terms strictly cash. Send for Catalogue and Testimonials.

G. W. AMESBURY & CO.,
3101 and 3103 Chestnut Street,
Philadelphia, Pa.

HANSON & VAN WINKLE, Sole Agents for Weston Dynamo Electroplating & Electrotyping Machines, Newark, N. J.

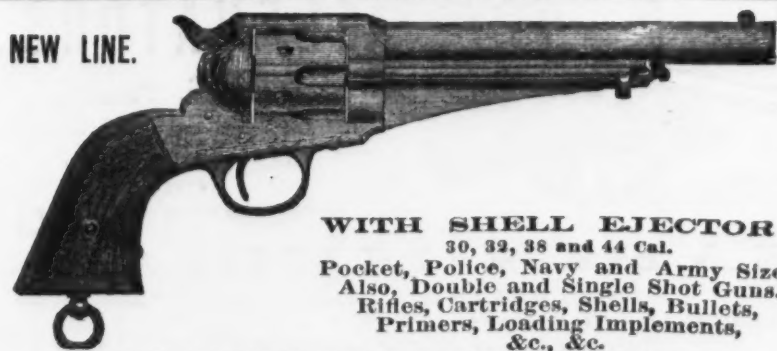


For Nickel, Bronze, Brass, Copper and Silver Plating.
Over 1000 machines in use.
Are used by all leading stove manufacturers.
Experienced men sent to put up machines and instruct purchasers.

INFRINGEMENTS.
We call attention to infringement of the Weston Machine in which Automatic Switches are used to prevent change of current. The Weston Co. are owners by grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.

MANUFACTURERS OF
Cast Nickel Anodes, Pure Nickel Salts, Polishing Materials.

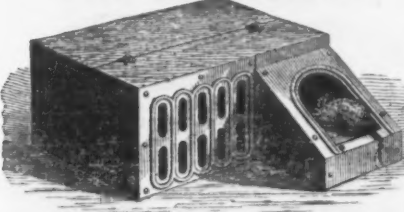
Manufactory, Newark, N. J. New York Office, 92 & 94 Liberty St.



WITH SHELL EJECTOR
30, 32, 38 and 44 Cal.
Pocket, Police, Navy and Army Sizes
Also, Double and Single Shot Guns,
Rifles, Cartridges, Shells, Bullets,
Primers, Loading Implements,
&c., &c.

Send for reduced catalogue and discounts of goods manufactured by
E. REMINGTON & SONS,
283 Broadway, NEW YORK.

THE DELUSION. THE GEM CARPET STRETCHER.



Patented June 8, 1880.
The Best and Cheapest in Use.

DIRECTIONS.—Tack the carpet at one side of the room, then go to the other side, and with the Stretcher draw the carpet into place, leaving the spur a few inches from the base-board. Take up the slack in the carpet under the spur and drive the spur gently into the floor; it will hold the carpet in place while you drive the tacks. Manufactured by

CLAUDIUS JONES & CO., Erie, Pa.

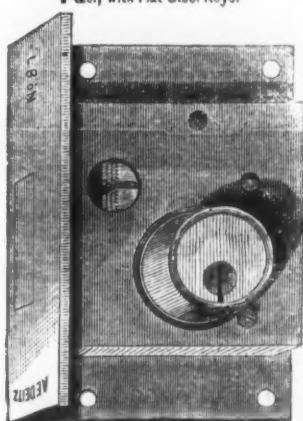
CHARLES H. HOWELL & CO.,

MANUFACTURERS OF FIRST QUALITY

PAINTS, COLORS, OILS, VARNISHES, DRYERS.

212, 214 & 216 Race St., Philadelphia, U. S. A.

A. E. DIETZ,
(Successor to Barnes & Dietz.)
Manufacturer of
Store Door Locks, Night Latches, Padlocks, Drawer Locks,
&c., with Flat Steel Keys.



Durrie & McCarty, Agents,
97 Chambers & 81 Reade Sts., New York.

THE FORSYTH SCALE CO.,
YOUNGSTOWN, O.,

Manufacture a full line of

FORSYTH'S STANDARD SCALES

Counter, Portable, Dormant,
Stock and Hay, and
R. R. Track

SCALES.

Call Special Attention to their
SUSPENSION HAY & R. R. TRACK SCALES.

Also, Warehouse Trucks and Letter Presses.
PRINCIPAL WAREHOUSES,

DURRIE & McCARTY, New York;
FORSYTH SCALE CO., Chicago;
SIMMONS HARDWARE CO., St. Louis.

PRIZE MEDALLISTS:

Exhibitions of 1862, 1867, 1869, 1872, 1873, and only award and medal for Noiseless Steel Shutters at Philadelphia, 1876; Paris, 1878, and Melbourne, 1881.

CLARK, BUNNETT & CO., LIMITED.

Late CLARK & COMPANY,
Original Inventors and Sole Patentees of

Noiseless Self-Coiling Revolving STEEL SHUTTERS,

FIRE AND BURGLAR PROOF. ALSO IMPROVED

ROLLING WOOD SHUTTERS,

Of various kinds. And Patent

METALLIC VENETIAN BLINDS.

Endorsed by the
Leading Architects of the World.

Office and Manufactory,
162 & 164 West 27th St., N. Y.

W. W. CULBERTSON, President.
A. FLUMER, Sec'y. Treas. and Gen'l Manager.

QUEEN CITY MALLEABLE IRON CO.,

Make all Shapes and Sizes of

Malleable Iron Castings

known to the trade. Our specialty is

WELDING MALLEABLE CASTINGS.

Guaranteed to weld perfectly and capable of being drawn under a hammer. Address,

N. W. Cor. Vine and Second Sts.,
Works, 585 & 587 Eastern Ave.,
CINCINNATI.

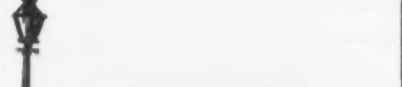
THACHER & CO.,

Manufacturers of



Thacher's Patent Belt Fasteners.
Sample and Price List free.

Office, 330 Euclid Avenue, Cleveland, Ohio.



R. D. WOOD & CO.,

Philadelphia,

Manufacturers of

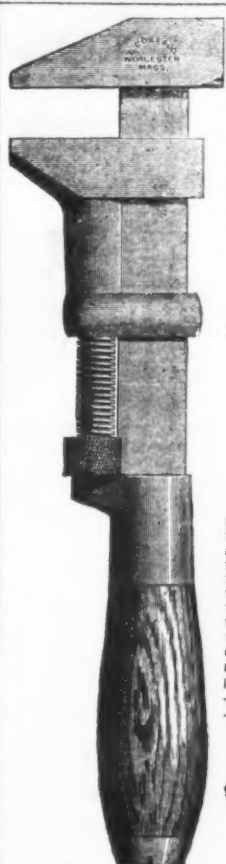
Cast Iron Pipe

FOR WATER AND GAS,

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.



L. COES'
Genuine and Mechanics

PATENT Screw Wrenches

MANUFACTURED BY

L. COES & CO.,

Worcester, Mass.

ESTABLISHED IN 1839.



Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped.

L. COES & CO.,

Worcester, Mass.

Warehouse,

97 Chambers and 81 Reade Sts.,

NEW YORK.

DURRIE & McCARTY,

Sole Agents.

CHAMPLAIN Forged Horse Nails.

MANUFACTURED BY THE

NATIONAL HORSE NAIL CO.,

Vergennes, Vermont.

HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST

NORWAY IRON AND WARRANTED.

A full line of "CHAMPLAIN" and "NATIONAL"

Nails always on hand at our Warehouse,

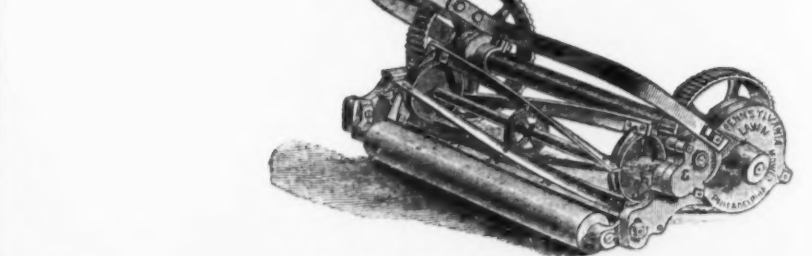
97 CHAMBERS AND 81 READE STREETS, NEW YORK.

DURRIE & McCARTY, Sole Agents.

The 1882 Pennsylvania Lawn Mower.

OUTSTRIPS ALL COMPETITORS. PREMIUMS TAKEN OVER ALL OTHER MOWERS.

EVERY MACHINE WARRANTED TO WORK AS REPRESENTED.



Also Manufacture the

BEST 10-INCH FORWARD CUT LAWN MOWER in the MARKET, named "OUAKER CITY."

For descriptive catalogue and prices write to

LOYD, SUPPLEE & WALTON, Philadelphia.

DURRIE & McCARTY, New York.

AMES FLOW CO., Boston, Mass.

PRATT & CO., Buffalo, N. Y.

SIMMONS HARDWARE CO., St. Louis, Mo.

HAMILTON & MATHEWS, Rochester, N. Y.

MARKLEY, ALLING & CO., Chicago, Ill.

DUCHARME, FLETCHER & Co., Detroit, Mich.

LOCKWOOD, VAN DOORN & TAYLOR, Cleveland, Ind.

ANDERSON HARDWARE CO., Indianapolis, Ind.

WM. FRANKFURTH & Co., Milwaukee, Wis.

WALTER S. LUDLOW, Cincinnati, Ohio.

LOYD & CLARKE, La Crosse, Wis.

T. M. CLARKE & CO., Atlanta, Ga.

PHILADELPHIA SMELTING COMPANY, Limited.

S. E. Cor. Twelfth and Noble Sts., PHILADELPHIA.

GENUINE BABBITT.

Guaranteed at a speed of 10,000 a minute, and at any pressure for 10 years.

Office JAMES BUTTERWORTH & Son, Manufacturers of Woolen Machinery, 262, 264 and 266 E. Adams St., PHILADELPHIA, October 17, 1881.

PHILADELPHIA SMELTING COMPANY.—GENTLEMEN: We have been turning your "Genuine Babbitt" on our wood drilling machine for the last eight years at a speed of 6000 revolutions per minute, without renewal. We have found it to be the best metal we ever used.

Yours truly,
JAMES BUTTERWORTH & SON.

DEOXIDIZED BRONZE,

Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

PHILADELPHIA, October 4, 1879.

PHILADELPHIA SMELTING COMPANY, City.—GENTLEMEN: After a trial of eighteen months of your "Deoxidized Bronze" as journal boxes in our rolling mill, where great pressure is required, we take pleasure in recommending it as being superior to any we have heretofore used.

Very truly,
HENRY DESSTON & SONS.

JACK SCREWS,

Press Screws, &c.

Cast with Perfect Seamless Thread by our new patent process.

Cheaper than Wrought Iron, not so apt to bend or strip the thread. Liberal discount to the trade.

SEEGER MFG. CO.,

Box 1513, SPRINGFIELD, MASS.

H. E. ASHCRAFT, Agent,

12 Murray St., and 15 Park Place, New York.

CAR BOX JACK,
For R. R. use
(under Hot Boxes).



VARIETY IRON WORKS.

KYSER & REX,

Manufacturers of

Hardware Specialties, Iron Toys, Novelties

and Housefurnishing Hardware,

Main Office and Factory, Trenton Ave. and Margaretta St., Frankford, Philadelphia

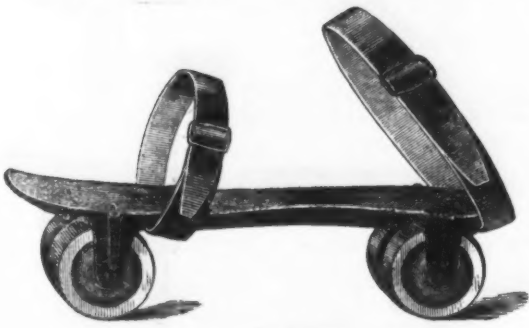
Branch Office, 19 & 21 S. 4th St., Phila. Hardware specialties manufactured to order.

New York Club Roller Skates.

THE MOST DURABLE of any MADE.

Easiest Working and Lightest.

Low Price and Excellent Quality. Also, Wood Top Roller Skates.



Send for Circular
and Prices.



W. A. SUTTON,

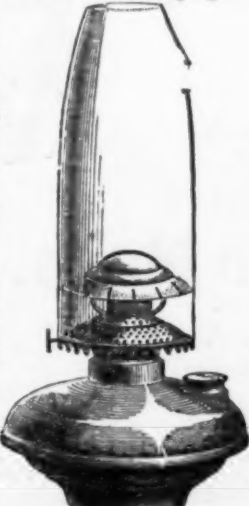
Manufacturer of Ice and Roller Skates.

522, 524, 526, 528 and 530 WEST TWENTIETH ST.,
NEW YORK.

PATENTED ARTICLES OF MALLEABLE IRON:

Hammer's M. I. Hanging Lamps.

Hammer's Adjustable Clamps.
Hammer's Malleable Iron Oilers, 3 sizes.



Hammer's Mail Iron Hand Lamps.
Pattern Heavy Screw Clamps; strongest
in the market.

B. Size.

For Sale by all the principal Hardware Dealers.
Send for price list.

Malleable Iron Castings of superior quality,
and Hardware Specialties in Malleable
Iron made to order.

HAMMER & CO.,
Branford, Conn.

The Sugar Maker's Friend

Twenty-five per cent. more
sugar and a better quality from
any other.

OVER
5,000,000
SOLD.
20,000 Maple Sugar Makers
use them. Their perfect working
with satisfaction is guaranteed.
Only a trial is needed to convince
one of their superiority over all others. ONE RE-
SPONSIBLE HARDWARE DEALER wanted as local
agent in every Maple Sugar Town not already engaged.
DESCRIPTIVE CIRCULARS, with price list and
SAMPLE SPOUTS, sent free to the trade only.
Owing to the unusual heavy orders at this season of
the year, it is necessary that all Agents and those de-
siring agencies forward their orders for the coming
SUGAR SEASON as EARLY AS POSSIBLE, to give
the required time for supplying ALL DEMANDS,
and that shipments by freight can be made so as to
reach their destination in due season. IN ORDER-
ING, STATE DISTINCTLY WHETHER TO SHIP BY
FREIGHT OR BY EXPRESS. Write immediately for
agency to E. F. PATENT, Burlington, Vt.
Buy the Eureka and you escape all infringements.

GEO. M. EDDY & CO.,

Manufacturers of

Measuring Tapes
Of Cotton, Linen & Steel.

ALL PURPOSES.

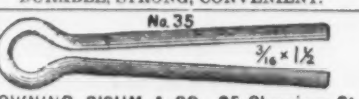
351 to 353 Nassau Ave., Brooklyn, N. Y.

CUTTERS WILL NOT BREAK.



THE DERBY BIT CO.

ANSONIA CONN.



DURABLE, STRONG, CONVENIENT.

No. 35

BROWNING, SISUM & CO., 85 Chambers St.

Manufacture
Belt Hooks, Cutters, Spring Keys, D Rings,
Staples, and everything pertaining to wire binding.
Factory, BROOKLYN.

ZERO

REFRIGERATOR.

with Water, Wine and
Milk Cooler, Best Food
and Ice Preserver in the
world. Send for
Book. A. M. LESLEY,
310 Ninth Avenue.

Also the Rotunda Fur
nace.

LEIGH'S

DISCOUNT BOOK

Specialty arranged for the use of the
HARDWARE TRADE.

Acknowledged by ALL the best work of the kind
ever published. Price by mail ONE DOLLAR.

Address

B. LEIGH, St. Louis Elevator, St. Louis, Mo.

THE PATENT

SCREW WINDOW BALANCE

With which the Sashes work as
with weights, their application
being at an expense of one-half
the cost of applied weights, no
bindings being required. The
Sashes are Locked with the meet-
ing rail lock. Stands alone by its
working. Price \$1 per set (four).
Discount to the trade. In use over
three years. Robt. B. Heguin.

SOLE MAKER: Hartford, Ct., U. S. A.

FRANCIS T. WITTE,

SUCCESSOR TO

KING, BRIGGS & CO.,

111 CHAMBERS STREET.

HARDWARE, CUTLERY AND GUNS.

Terms of Payment, Net Cash. No Discount.

Goods will be sent to well-known houses, for which we will draw at ten days. Orders from
strangers must have a satisfactory reference to a city house, or we can forward by freight, goods to
be delivered upon payment of accompanying draft. If sent C. O. D. collection charges will be added.
All quotations will be found exceedingly low. We make them thus to meet the demands of CASH
BUYERS, which is the trade we seek. Our illustrated Hardware Price Current is calculated at net
cash rates. ALL DISCOUNTS OFF. Send for it.



MANURE FORKS.

BROWN, HINMAN & CO., 4 OVAL TINES, CAP FERRULES.

D Handles.

Plain Ferrules, Blue, No. 16P, \$4.20; 5P, \$5.08

Bronzed, No. 1P, 5.72

Strapped, Blue, No. 16S, \$4.00; 5S, 5.78

Bronzed, No. 1S, 6.47

Long Handles.

Plain Ferrules, Blue, No. 17P, \$3.27; 6P, 4.90

Bronzed, No. 1P, 5.57

Strapped, Blue, No. 17S, \$4.70; 6S, 5.58

Bronzed, No. 1S, 6.30

HAY FORKS—Price Per Dozen.

BROWN, HINMAN & CO.

3 Oval of Round Tines, 5 1/2 Feet Handles, Cap

Ferrules.

Plain Ferrules, Blue, No. 3 1/2P, \$2.54

Bronzed, No. 3P, 3.17

Strapped, Blue, No. 3 1/2S, 3.50

Bronzed, No. 3S, 3.99

3 Tines, 5 1/2 Feet Handles, Cap Ferrules.

Plain Ferrules, Blue, No. 1 1/2P, 3.50

Bronzed, No. 1P, 3.98

Strapped, Blue, No. 1 1/2S, 4.25

Bronzed, No. 1S, 9.37

HANDLED FIELD OR GARDEN HOES.

BEST MAKERS—BROWN, HINMAN & CO.



Steel Blades.

No. 5 Riveted Shank, Blue Finish, Per doz. \$3.20

No. 5 1/2 Riveted Shank, Blue Finish, 3.35

No. 4 Solid Shank, Bronzed Finish, Ladies' Garden Hoe, 2.68

No. 3 Solid Shank, Blue Finish, Strong Field or Garden Hoe, 3.26

No. 2 Solid Shank, Bronzed Finish, 3.58

No. 1 1/2 Solid Shank, B Finish, 3.68

No. 1 Solid Shank, B Finish, 4.00

HANDLED PLANTERS' HOES.



BROWN & HINMAN'S BEST.

No. 00, No. 0, No. 1, No. 2, No. 3, No. 4

6 1/2 in. 7 in. 7 1/2 in. 8 in. 8 1/2 in. 9 in.

\$4.40 4.60 4.85 5.10 5.30 5.57

STAR LOCK WORKS.

ESTABLISHED 1836.

Trunk Locks, Door Springs,

Pad Locks, Trunk Stays,

Dead Latches, Keys, &c., &c.

110 South 8th St., and Sanson, bet. 8th

and 9th, PHILADELPHIA.

PATENTED

Scand. Pad Locks

With Flat Keys.

Shackle secured to

the Lock Box.

HILLEBRAND & WOLF.

VERMONT SNATH CO.,

Manufacturers of

Pat. Swing Socket Snaths

and also a large variety of other styles of Snaths

Springfield, Vermont.

Represented in New York by Lamson & Good-

now 110 W. 110

BUFFALO SCALE CO.,

BUFFALO, N. Y.,

Manufacturers of

R. H. Track Scales, Hay Scales, Coal

Scales, Grain Scales, Platform

Scales, Counter Scales, &c.

Send for price list, stating what you want

R. Onderdonk,

Sole Manufacturer of

LEVER LEMON

SQUEEZER,

With Perforated Strainer.

405 Grand St.,

NEW YORK.

B. FITTS PATENT MAGNETIC

METAL SEPARATOR,

Manufactured by

EZRA SAWYER,

23 Hermon St., WORCESTER, MASS.

EXPERT.

E. P. ROBBINS, M. E.,

Mechanical, Patent and In-

ventor Expert,

CINCINNATI, OHIO.

For particulars see issue of March 2, 1882.

GARRY IRON ROOFING CO.,

Manufacturers of all kinds of

Iron Roofing and Crimped Siding,

Fire-Proof Doors and Shutters.

GARRY'S

PATENT

IRON ORE PAINT AND CEMENT.

79 & 81 Columbus Street, CLEVELAND, OHIO.

Send for circulars and price lists, No. 15.

SPECIAL NOTICE.

We offer to the trade the following low prices

for SPOT CASH to close out a surplus stock:

20,000 dozen Loose Pin Butts at 60 and 10 discount;

5,000 dozen Loose Pin Butts, Janned, at 70 dis-

count; 5,000 Silver Tipped at 70 discount; Wire

Cloth, \$2.40; Torrey's Door Springs, \$3.50; Strap

and T Hinges, 100,000 dozen, at 50 and 10 discount;

Wrought Butts, at 50 and 10 discount; Screws, 30

and 10; Locks, 50 per cent. and some at 50 and 10;

3-Fly Rubber Hose at \$3.50 per 50 feet. Couplings

included; \$25,000 worth Stamped Tin Ware at 60

per cent. discount.

Above are subject to quantities on hand at time of

receipt of order.

A. W. WHEELER,

141 Lake St., Chicago, Ill.

HEADQUARTERS FOR BARGAINS IN HARD-

WARE.

BONNEY'S PAT. PARALLEL VISES.

12 Different Sizes

and Styles.

from 1 1/2 to 14 inch

width of jaws, and

in weight from 1 to

2 lbs. Over 200,000

made and sold in the

past four years, with

continually increasing

demand. We are

the only ones mak-

ing a line of cheap

small vises in Amer-

ica. We make, also,

and other goods. Send for Price List.

BONNEY VISE AND TOOL CO., 3015

Chestnut St., Philadelphia, Pa.

P. S.—We furnish stands for holding full lines of

the 12 Vises.

FOR SALE,

At New England Machinery Depot,

308 North Third St., Philadelphia, Pa.

Horizontal, Vertical and Locomotive Tubular

Boiler, from 3 to 60 H. P., in stock and larger to

order. Engines all sizes. Pumps, Heaters, Injec-

tors, steam and hand Brick and Mortar Hoists,

Boiler Test Pumps. The new Gravity Coffee

Roaster. All of the above constantly kept in stock.

Send for circular and price list.

BARNES'

Patent Foot and Steam Power

Machinery. Complete outfit for

FIRE SAND AND CLAYS.

PURE ZINC BERTHA SPELTER.

BERTHA SPELTER CERTIFICATE OF ANALYSIS.

DEAR SIRS:—

The sample of Spelter marked "Bertha Zinc," submitted to me for
examination, contains

IRON, - - - - 0.0371 per cent.

ZINC, - - - - 99.9629 " "

TOTAL, - - - - 100.0000 " "

Lead, Copper, Cadmium, Manganese, Arsenic, Antimony and Sulphur,
were carefully tested for, but with negative results, it being im-
possible to obtain weighable quantities, although a large pro-
portion of the Spelter was taken for the Analysis.

Very Respectfully,

P. DE P. RICKETTS, E. M. PH., D.,

Assayer and Chemist, cor. 50th St. and Fourth Ave., New York City.

The following letter from the Purchasing Agent of Pennsylvania
Railroad explains itself.

THE BERTHA ZINC MINING AND SMELTING CO.

GENTLEMEN:—

Our chemist has examined the sample of zinc you recently left at
Altoona, and pronounces it a very pure article. When you are pre-
pared to put it on the market I will be glad to have you advise me with
price.

Yours truly,
ENOCH LEWIS, Pur. Agt.

FOR SALE BY

MERCHANT & CO.,

AGENTS FOR MANUFACTURERS,

525 Arch Street, PHILADELPHIA, PA.

MOLDING SAND AND FOUNDRY FACINGS.

OUR STOVE PLATE FACING IS INDORSED BY THE LEADING STOVE FOUNDERS.

Read the Following Testimonial:

Office of FULLER, WARREN & CO.,

Troy, N. Y., February 21st, 1882.

To Whom it May Concern:

We have during the past four months used about 75 barrels of the "WHITEHEAD STOVE
PLATE FACING," and find it the best and most economical that we have ever had in our
Works, and shall continue to use it while supplied with the present quality. This Facing
is manufactured by the AMERICAN FACING CO., 515 West 15th Street, New York City.

A. H. EATON, Superintendent.

SHOVELS, RIDDLERS, BRUSHES, &c.

WHITEHEAD BROS.

AMERICAN FACING CO.

515 and 517 West 15th St., New York.

WM. WHITEHEAD, Treas.,

517 W. 15th St.,

New York.

The Iron Age Directory

and Index to Advertisements.

PAUSE

Agricultural Implements.

Grant Farm Mill and Cradle Co., Melrose, N. Y. 38

Air Compressors.

Clayton Steam Pump Works, 14 and 16 Water st., Brooklyn, N. Y. 42

Air Pumps.

Weinhold H. Johnson, Philadelphia, Pa. 7

Arm and Ammunition.

Bedford Ward, Danbury, Conn. 77

Barbed Wire.

Conway T. O., 88 Chambers, N. Y. 31

Barrel Making.

Eaton E. E., Chicago, Ill. 10

Barrel Staves.

Field and Graham, 17 Maiden Lane, N. Y. 12

Barrel Staves.

Lovell John P. & Sons, Boston, Mass. 42

Barrel Staves.

Remington & Co., 28 Broadway, N. Y. 12

Barrel Staves.

Stevens J. & Co., Chicago Falls, Mass. 16

Barrel Staves.

Usher & Norris, Trenton, N. J. 16

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Barrel Staves.

Wheeler R. T., Chicago, Ill. 32

Differential Pulley Blocks.

Tale Lock Mfg. Co., 43 Chambers, N. Y. 3

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Discount Books and Tables.

Jennings S. H., 28 Broadway, N. Y. 12

Door Collars.

Medford Fancy Goods Co., 65 Duane, N. Y. 31

Horse Clippers.

Robert J. & Co., 101 and 103 Duane, N. Y. 32

Horse Hay Forks.

Waldron John, Muncy, Pa. 28

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

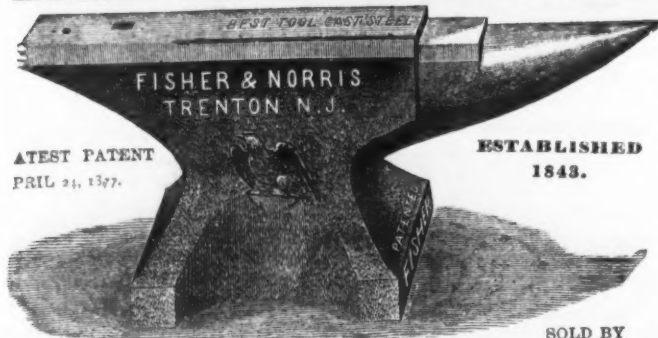
Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7

Horse Nails.

Bridgewater Iron Co., Bridgewater, Mass. 7</

THE "EAGLE" ANVIL.

ATTEST PATENT
PRIL 21, 1877.

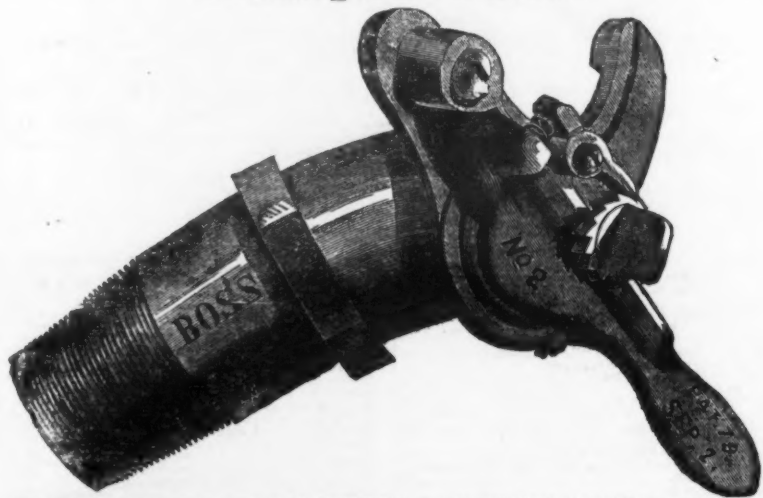
ESTABLISHED
1843.

SOLD BY

New York—RUSSELL & ERWIN MANUFACTURING COMPANY, DUBIE & McCARTY, TENNIS & WILSON.
Philadelphia—JAMES G. HAND & CO. Boston—GEORGE H. GRAY & DANFORTH.
Baltimore—W. H. COLE & SONS, JOHN E. KELSO, JR. Cincinnati—POST & CO. Cleveland—THE LAKE ERIE IRON CO.

BOSS MOLASSES GATE.

Coddington's Patent.



The only Molasses Gate made with RATCHET on TIGHTENING SCREW, to secure a regular pressure, and hold it securely so as to prevent leaking.

ALSO,

Kimball's Solid Cast-Steel Shovels & Spades,

Lockwood's Solid Cast-Steel Hoes,
Kieser's Double Shear Cut Meat Cutters

Send for Price List.

KIMBALL SHOVEL CO., Sole Manufacturers,
Office, 67 German Street, BALTIMORE, MD., U. S. A.

PERFORATED SHEET METALS.

For Coal and Ore Separators, Revolving Screens, Jigs, Washers, Stamp Batteries, Mining and Smelting Works, Silver Reduction and Concentrating Works, &c., &c.

For Centrifugals, Brewing, Distilling, Wool and Sugar Machinery, Purifier Trays for Gas Works, Coal and Coke Works, Flour, Cotton, Oil, Paper and Pulp Mills, &c.

Iron, Steel, Copper, Brass, Zinc and other metals punched to any size and thickness, for all uses.

HARRINGTON & OGLESBY CO.
Nos. 43, 45 & 47, South Jefferson St., CHICAGO, ILL.

Special discounts to the trade. Correspondence solicited.

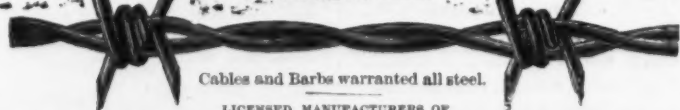
**Patent Steel Tube and Flue Brush.**

Best in the market.
Made any size required.
Combines the properties of a
Scraper and Brush.
Full stock always on hand.

L. B. FLANDERS MACHINE WORKS,
1025 Hamilton St., Philadelphia, Pa.

THE CINCINNATI BARBED WIRE FENCE CO.

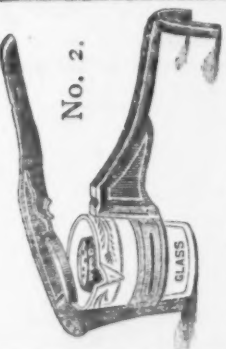
OFFICE AND FACTORY,
32, 34, 56, 58 & 60 New Street,
CINCINNATI, OHIO. C. W. COLE, Sec'y.



Cables and Barbs warranted all steel.

FOUR-POINTED BARBED WIRE FENCING.

We have large stock of Galvanized, Red and Brown Painted Barbed Wire on hand, and can fill all orders promptly. Send for sample and prices.

**THE DEAN LEMON SQUEEZERS.**

(Patented February 7, 1882.)

SOLD TO JOBBERS ONLY.

Price List—Dis. 40¢.
No. 1.....\$15 per doz. | No. 2.....\$9 per doz.
No. 3.....\$5.50 per doz

When the Squeezers cannot be obtained from the Jobbers, send orders direct. Samples sent for \$1.50. Mention this paper.

WM. B. DEAN,
3 Murray Street, New York.
A. B. DEMING, Traveling Agent for Jobbing Trade.
WM. THOMSON & CO., Toronto, Sole Agents for Canada.

**THE SHRODER DOOR SPRING.**

The BEST DOOR SPRING in the MARKET.

It will hold a door open as well as shut, and by its peculiar form has four inches more leverage to hold a door shut, closing it tight, where all other Springs fail. No latch required with this Spring.

DELONG & SHRODER, Manufacturers,
Warren, Illinois.

Correspondence solicited with jobbers and large dealers. We will send a full-size Spring or a small model free, on application. Try it.

CHEMICALS AND APPARATUS

FOR THE ANALYSIS OF

ORES, IRON, STEEL, FUEL, FLUXES, FURNACE GASES, &c.,

Our Specialty. Being direct Importers and Manufacturers we can offer superior inducements.

EIMER & AMEND,

Nos. 205 to 211 Third Avenue.

NEW YORK.

Eighteenth Street Station Elevated R. R.

Illustrated Catalogue Mailed on Application.

WARRANTED!!

Better than the Best English Anvil.

Face in one piece, of BEST TOOL CAST STEEL. PERFECTLY WELDED, perfectly true; of hardest temper and never to come off or "settle." It does not bounce the hammer back, and therefore can do more work with lighter hammer. Horn of tough untempered steel, never to break or bend. Only Anvil made in United States fully warranted as above. None genuine without our trade-mark.

N. B.—That the "Eagle" Anvil is the only one made at Trenton, New Jersey, and it must not be mistaken for an Anvil in the market called Trenton, but which is really of foreign manufacture, and an imported imitation of the English Anvil.



TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge,
Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS.

Brooklyn White Lead Co.



TRADE MARK

White Lead, Red Lead & Litharge.
No. 182 Front Street,
NEW YORK.

JOHN JEWETT & SONS,

Manufacturers of the well-known brand of

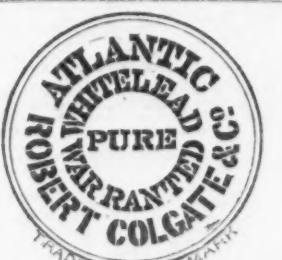
WHITE LEAD.



TRADE MARK

ALSO MANUFACTURERS OF
LINSEED OIL.

181 Front Street, NEW YORK.



The Atlantic White Lead and
Linseed Oil Co.,

Manufacturers of

White Lead (Atlantic), Red Lead, Litharge, Glass Makers' Litharge and Orange Mineral;

LINSEED OIL,

Raw, Refined and Boiled.

ROBERT COLGATE & CO.,

287 Pearl St., NEW YORK.

John Waldron,

Manufacturer of

Sprout's Double and Single Shear

Horse Hay Forks

And Sprout's

HAY ELEVATORS,

PULLEYS and GRAPPLERS.

Send for Circulars.

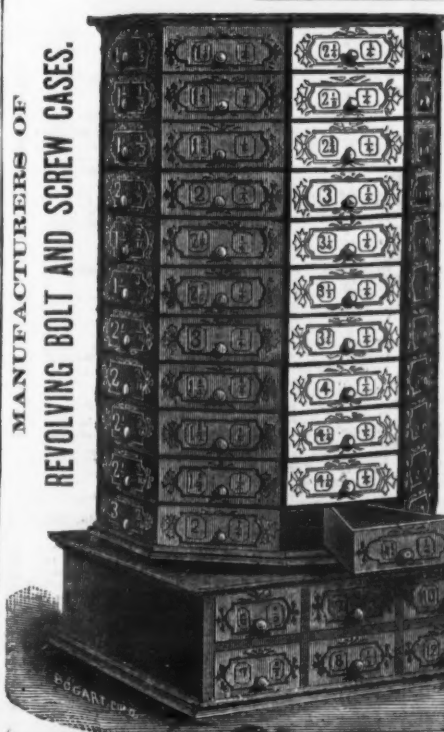
Muncy, Lycoming Co., Pa.

**American Bolt and Screw Case Co.,**

Successors to W. R. Baker & Co.,

DAYTON, OHIO.

MANUFACTURERS OF
REVOLVING BOLT AND SCREW CASES.



We take pleasure in informing the Trade that we are sole owners and manufacturers of the above very useful article, which no retail Hardware Dealer should be without, as they prevent mixing of Screws or Bolts, enabling him to keep his stock in good shape; and in convenience alone will pay for themselves in a very short time. They are Compact, Substantially Made, Handsomely Finished, and present a highly ornamental appearance on the counter. The drawers are provided with stops to prevent their removal from the case.

PRINCIPAL AGENTS.

LLOYD, SUPLEE & WALTON, Philadelphia.

A. F. SHEPLEIGH & CANTWELL, St. Louis.

HARDWARE CO., Pittsburgh.

BINDLEY HARDWARE CO., Baltimore.

SAMUEL G. B. COOK & CO., Louisville.

BOYD & HUBBERT, St. Louis.

SIMMONS HARDWARE CO., Detroit.

DUCHARME, FLETCHER & CO., San Francisco.

HUNTINGTON, HOPKINS & CO., Chicago.

HIBBARD SPENCER, BARTLETT & CO., Chicago.

MARKLEY, ALLING & CO., Chicago.

HOWELL GAND & CO., Cincinnati.

SEND FOR ILLUSTRATED PRICE-LIST.

DROP FORGINGS OF EVERY DESCRIPTION.

AGRICULTURAL IMPLEMENT AND

MISCELLANEOUS FORGINGS A SPECIALTY



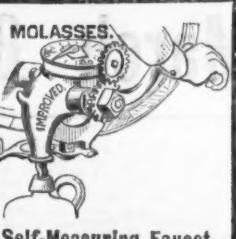
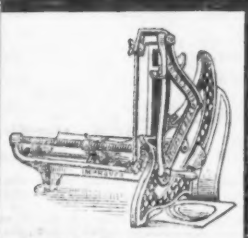

Superior Work at Reasonable Prices.

* ESTIMATES * FURNISHED *

CHICAGO STEEL HORSE SHOE CO.

COMPANY'S WORKS 20 West Lake St.

AT PULLMAN (NEAR CHICAGO) CHICAGO.

| | | |
|---|---|---|
|  Fruit, Wine & Jelly Press. |  SAUSAGE STUFFER. |  Self-Measuring Faucet. |
| <p>ENTERPRISE MANUFACTURING CO. OF PA., THIRD & DAUPHIN STS, PHILADELPHIA, PA.</p> <p>Awarded First Premium Everywhere.</p> <p>Twenty different sizes from \$2 to \$100.</p> <p>NO. 20 COFFEE MILL.</p> | | |
|  Smoked Beef Shaver. |  SAUSAGE CUTTER. |  Tobacco & Root Cutter. |

Tincture Presses,
Self-Weighing
Cheese Knife,
Cork Presses.

THE BEST
ARE THE
CHEAPEST.

MRS. POTTS'
Cold Handle Double Pointed Sad Irons.

SOLD BY HARDWARE DEALERS.
SEND FOR ILLUSTRATED CATALOGUE, FREE.

THE TURNER & SEYMOUR MFG. CO.,

WOLCOTTVILLE, CONN.,

Manufacturers of

The "AMERICAN" and CLIPPER SHEARS, Celebrated FAMILY EGG BEATER, JUDD'S and other SHADE FIXTURES, PICTURE NAILS, and a large line of UPHOLSTERERS' and FANCY HARDWARE and METAL NOTIONS.



HOLIDAY GOODS.

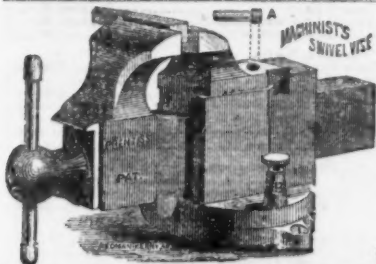
We desire to call special attention to our line of
Nickel Plated Nut Picks, Nut Crackers and Fruit Knives.

They are fine in appearance, durable and very cheap. They are put up in sets in handsome imitation Morocco boxes, or any of the articles alone in common boxes.

We also have a fine line of

Nickel Plated Scissors,

and many other goods suitable for Holiday trade. Price Lists and discounts furnished the trade on application.



PRENTISS' PAT. VISES,

Adjustable Jaw.

Stationary or Pat. Swivel Bottoms.
ADAPTED TO ALL KINDS OF VISE WORK. ALSO
"PEERLESS" SWIVEL PIPE GRIP,
FITS ANY VISE. SOLD BY THE TRADE.

PRENTISS VISE CO.,

23 Day Street, New York.
SOLE PROPRIETORS. SEND FOR CIRCULAR

THE STANLEY WORKS,

MANUFACTURERS OF

Wrought Iron Butts, Hinges

AND

DOOR BOLTS,

Plain, Japanned, Bronzed and Plated.

FACTORIES:

WAREHOUSE:

New Britain, Connecticut.

79 Chambers St., New York.



Wilson Bohannon,

Manufacturer of Patent

BRASS PAD LOCKS

For Railroad Switches, Freight Cars, and the Hardware Trade. All sizes, with Brass and Steel Keys, with and without chains.

Patent Horizontal Rim Cylinder Night Latch.

Self-adjusting to doors of any thickness, with Patent Stop and Drawer Back Knob.

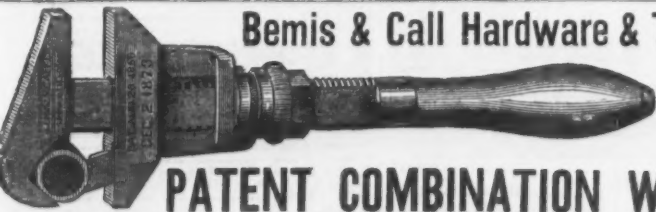
RIGHT OR LEFT HAND.

PASSENGER CAR LOCKS, Bronzed, Nickel-Plated and Japanned.

Catalogues and Samples sent on application.



Bemis & Call Hardware & Tool Co.



PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite combinations of a regular Nut Wrench thus making a combination which has no equal.

For Circulars and Price List, address

BEMIS & CALL HARDWARE & TOOL CO., Springfield, Mass.

GUN POWDER.

Laflin & Rand Powder Co.,

No. 29 Murray Street, New York,

Manufacture and sell the following celebrated brand

of Sporting Powder known everywhere as

ORANGE LIGHTNING,

ORANGE DUCKING,

ORANGE RIFLE

more popular than any Powder now in use.

Blasting Powder and Electrical Blasting

Apparatus.

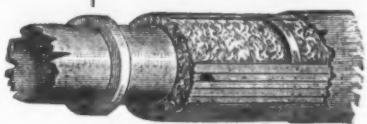
Military Powder on hand and made to order.

SAFETY FUSE, FRICTIONAL & PLATINUM

FUSES.

Pamphlets showing sizes of grain sent free.

Mineral Wool.



A fibrous material, enclosing about 90 per cent. of its volume of air, and therefore a superior

NON-CONDUCTOR

OF

HEAT AND SOUND.

Being made from the slag of blast furnaces, it is fire-proof and durable in contact with heated surfaces. Readily applied.

Heaviest grade about 25 lbs. per cubic foot. Price, 1 cent per lb. at works.

U. S. MINERAL WOOL CO.

16 Cortlandt St., New York.

A. F. PIKE.

Pike Station, - - New Hampshire,

Manufacturer and Wholesale Dealer in

Bluestone

For Scythes, Axes, Knives and Turpentine Hacks.

Factories at Pike Station, N. H.,

and Evansville & Westmore, Vt.

Genuine Old Reliable,

Indiana Pond (Red End),

Premium Union,

White Mountain,

Letelle, Hucker,

Diamond Grit,

The New Boss,

Lamotte, Rugg,

Willoughby Lake,

Green Mountain,

Black Diamond,

Mowing Machine,

German Pattern,

Chocolate, Ax Bits,

Stones made, labeled and branded in any style desired. Price and Quality Guaranteed. All the above brands are of clear, k. en grit and will not glaze.

Grindstones, Emery, &c.

Walter R. Wood,

GRINDSTONES.

Berea, O., Nova Scotia, & other brands.

983 and 985 Front Street, New York.

GEO. CHASE,

The largest manufacturers in the world of

OIL

STONE

Of all description.

107th Street and Harlem River,

Send for Illustrated Price List. NEW YORK.

McDERMOTT & BEREA STONE CO.

ALL SIZES & GRITS. SEND FOR PRICES.

GRINDSTONES

CLEVELAND, O.

OHIO GRINDSTONE COMPANY,

H. H. CLOUGH, Pres. J. M. WORTHINGTON, Secy.

JAMES NICH LL, V. Pt. E. K. MUSSEY, Treas.

Manufacturers of

GRINDSTONES

Of All Kinds.

127 Superior Street,

CLEVELAND, OHIO.

ATLANTIC STONE CO.,

Quarrymen and Stone Merchants.

GRINDSTONES

of genuine Nova Scotia and other grits from our

own quarries. Mounted stones and fittings, scythe

and oil stones, polishing grits, &c.

474 & 478 Atlantic Ave., Boston, Mass.

LOMBARD & CO.,

Importers and Dealers in all kinds of

GRINDSTONES,

Cor. Lewis Wharf & Atlantic Ave., Boston.

Stones for Machinists, Carpenters, Farmers and

Glass Cutters constantly on hand and cut to order.

Providence Tool Co.,

PROVIDENCE, R. I.

SHIP, FLOOR AND ICE

SCRAPERS,

PRICES ON APPLICATION.



HENRY B. NEWHALL,
105 Chambers St.,
NEW YORK AGENT.

J. H. WORK,
13 Pearl St.,
BOSTON AGENT

S. H. & E. Y. MOORE,
163 & 165 Lake St.,
CHICAGO AGENT.

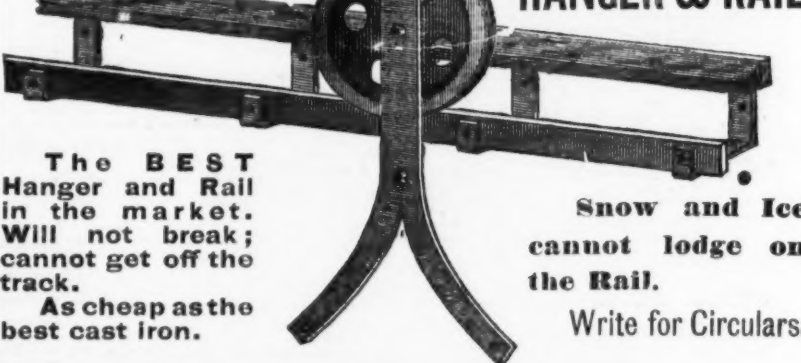
THE CLARK MFG CO. BUILDERS' HARDWARE

BUFFALO, N. Y.

Terry's WROUGHT Iron

BARN DOOR

HANGER & RAIL



The BEST
Hanger and Rail
in the market.
Will not break;
cannot get off the
track.

As cheap as the
best cast iron.

Snow and Ice
cannot lodge on
the Rail.

Write for Circulars.

TERRY MFG. CO., Dundee, N. Y.



'RAPID TRANSIT' TRAP

Has no superior, and is a sure and certain catcher of Mice. With the Metal Platform resting on wood bottom of Trap, an invitation is always extended to Mice of whatever "kind, color or condition of race," into secure and grated quarters, from which they are released by opening cover of Trap and depositing contents into a pail of water.

The Mice go in at a rapid rate, And each one sets it for his mate.

Patented August 27, 1878.

Manufactured by

THE SMITH & EGGE MANUFACTURING CO., Bridgeport, Conn.

CHAMPION

HOG RINGER

RINGS and HOLDER.

Only one kind ever

invented. The only

Ring that will effectively

keep Hogs from

rooting. No sharp

points in the nose.



EAGLE BILL

CORN HUSKER

is the best Husker in the

market. Farmers say it

is the best. Use no other.

Rings 75c. Rings, 40c. 100. Holders, 75c. Huskers, 10c.

CHAMPIONS, BERING & QUINN & N. Exclusive Manufacturers, Decatur, Ill.

BLAKE

CRUSHER CO.,

New Haven Conn.



BLAKE'S

Challenge Rock Breakers.

Patented Nov. 18, 1879.

See The Iron Age first issue of the month.

RIVETS

C. F. HARRISON,
BOILER, BRIDGE & TANK
CUYAHOGA FALLS, OHIO.

RIVETS

THE

Improved Howe Scales



Portable Scales,

Counter Scales,

R. R. Depot Scales,

Track Scales,

Rolling Mill Scales,

Warehouse Scales,

Elevator Scales.

Page, Fargo & Co.,

325 Broadway, New York.

WITHEROW & GORDON,

Engineers & Contractors

PITTSBURGH, PA.

Sole Agents for the

WHITWELL

HOT BLAST STOVES.

OVER 600 IN USE.

The following parties either have them in use

under construction.

Cedar Point Iron Co., N. Y.

Dunbar Furnace Co., Pa.

Crane Iron Co., Pa.

Pennsylvania Steel Co., Pa.

Neshannock Iron Co., Pa.

R. H. Coleman, Lebanon, Pa.

Chester Rolling Mill Co., Pa.

Davenport, Fairbairn & Co., Pa.

Isabella Furnace Co., Pa.

Paxton Furnace, Pa.

Spearmen Iron Co., Pa.

Etna Iron Works, Ohio.

Milton Coal and Iron Co., Ohio.

Winona Furnace Co., Ohio.

Moss & Marshall, Ohio.

H. Campbell & Sons, Ohio.

Hooking Valley Iron Co., Ohio.

Cleveland Rolling Mill Co., Ohio.

Kaiser Iron Co., Ill.

North Chicago Steel Co., Ill.

Union Iron and Steel Co., Ill.

Means & Culbertson, Ky.

Ashland Furnace Co., Ky.

Norton Iron Co., Ky.

Southern States C. I. and S. Co., Tenn.

Sewanee Furnace Co., Tenn.

James C. Warner, Rising Sun, Ga.

Ohio Iron Co., Zanesville, O.

Sloss Furnace Co., Ala.

New York Wholesale Prices, March 8, 1882.

HARDWARE.

[illegible][illegible][illegible][illegible][illegible]



Issues Policies of Insurance after a careful inspection of the Boilers
COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS.

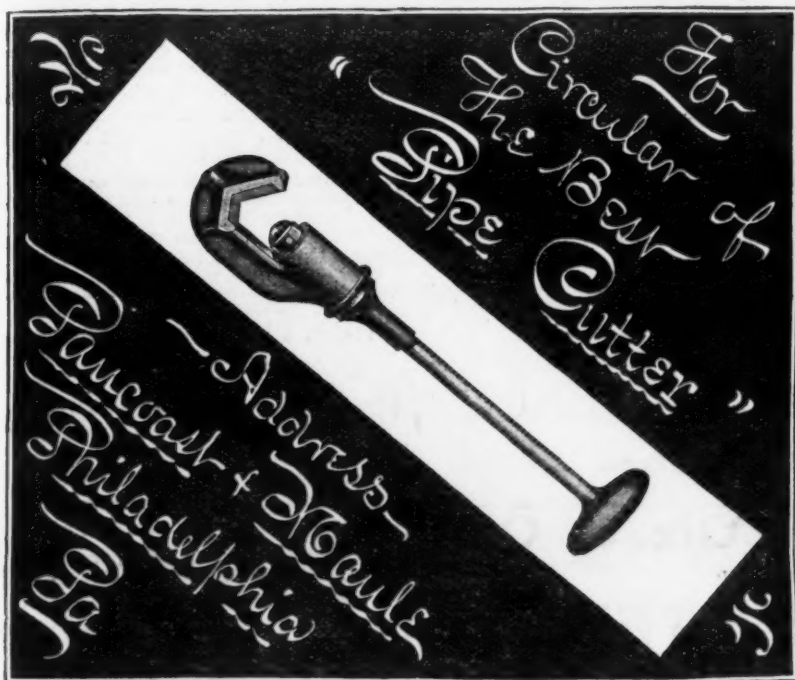
Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

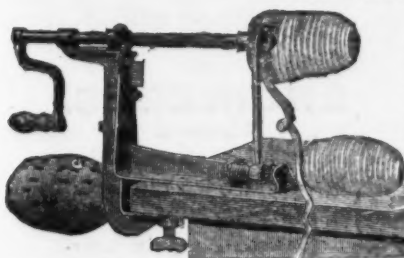
J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec.

Board of Directors:
J. M. ALLEN, President.
LUCIUS J. HENDEE, Pres't Etna Fire Ins. Co.
FRANK W. CHENEY, Asst. Treas. Cheney Brothers
Silk Manufacturing Co.
CHARLES M. BEACH, of Beach & Co.
DANIEL PHILLIPS, of Adams Express Co.
GEO. M. BARTHOLOMEW, Pres't Amer. Nat'l Bank.
RICHARD W. R. JARVIS, Pres't Colt's Fire Arms
Manufacturing Co.
THOMAS O. ENDERS Sec'y Etna Life Ins. Co.
EVERETT BRAINARD of Case, Lockwood & Brain-
ard.
GEO. W. B. FRANKLIN, Vice Pres't Colt's Pat. Fire
Arms Mfg. Co.
GEO. CROMPTON, Crompton Loom Works, Worcester
WILLIAM ADAMSON, of Baeder, Adamson & Co.,
Philadelphia.
HON. THOS. TALBOT, Ex-Governor of Mass.
NEWTON CASE, Case, Lockwood & Brainard, Hartford
WILLIAM S. SLATER, Cotton Manufacturer, Prov-
dence, R. I.
NELSON HOLISTER, of State Bank, Hartford.
D. H. SMITH, Pres't Springfield Fire & Marine Ins. Co.



GOODSELL'S WHITE MOUNTAIN POTATO PARER.

Patented June 14, 1881.



The White Mountain Potato Parer is the only machine ever made that will not only pare a potato much better than it can be done by hand, taking off a thinner paring from every shape or kind of potato, but will go into and clean out the eyes, and altogether at a saving of at least 50 per cent. It is free from the objections made to the old style of rattletrap, geared parers; is solid and substantial, cannot get out of order, and so cheap as to be within the means of everybody. Almost any of the Potato Parers in the market seem as if they might do the work better "next time," but the "White Mountain" DOES IT NOW. Every Machine warranted as represented.

Price to the Trade, \$7.50 per dozen.
GOODSELL CO., Antrim, N. H., Sole Manuf'rs.

PENFIELD BLOCK CO.,

LOCKPORT, N. Y.

MOORE'S HAND HOIST.

1200-lb. size, JUST OUT, price \$30 each;

600-lb. size, price \$25 each.

SEND FOR SAMPLES OR DESCRIPTIONS.

HENRY B. NEWHALL,
105 Chambers Street,
NEW YORK AGENT.

S. H. & E. Y. MOORE,
163 & 165 Lake Street,
CHICAGO AGENTS.

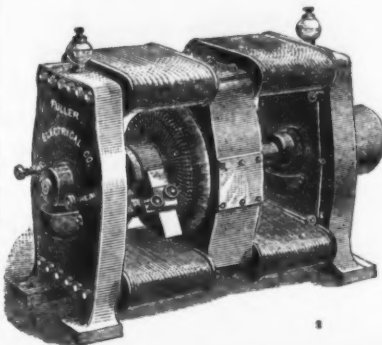
SANFORD'S PATENT OX SHOE



Is the only shoe that will not lame an ox, which he can stand up square upon, and will prevent slipping. Six sizes. Liberal discount to dealers. Manufactured by

SHADBOLT, BOYD & CO., Milwaukee, Wis.

ELECTRIC LIGHT.



THE FULLER ELECTRICAL COMPANY, having perfected their system of Electric Lighting, are prepared to furnish the Improved Gramme Dynamo Electric Machines and Electric Lamps, either for single lights or for from 2 to 20 lights in one circuit. This apparatus is unexcelled for durability, steadiness of light and economy of power, and requires less attention than any other.

For Price List and further particulars apply to

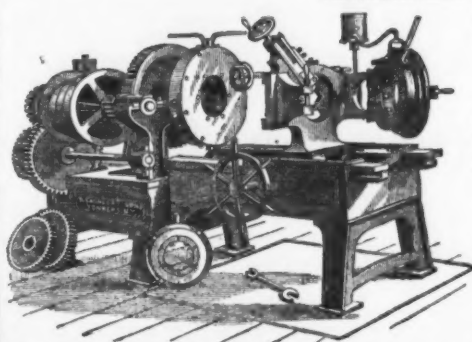
The Fuller Electrical Co.,

44 East Fourteenth St.,

NEW YORK.

D. SAUNDERS' SONS,

MANUFACTURERS OF



Pipe Cutting & Thread-
ing Machines

For Pipe Mill and Steam
Fitters' Use.

TAPPING MACHINES

For Steam Fitting.

Also

Steam & Gas Fitters' Hand Tools
YONKERS, N. Y.

Send for Circular.

THOMPSON McCOSH, Pres.

ROBERT DONAHUE, Treas.



PHILADELPHIA SCREW CO., Limited,

Twelfth and Buttonwood Streets, PHILADELPHIA.

Manufacturers of

IRON & BRASS WOOD SCREWS.



Quality, finish and tests as to strength guaranteed equal to any in the market.

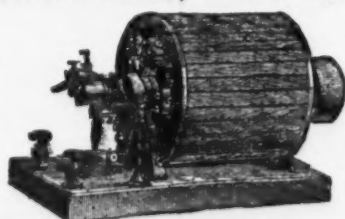
With improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts. A full line in stock.

The American Dynamo-Electric Machine,
For Electro-Plating, Electrotyping, &c.

Requires no Water.

Combining

all the



Latest

Improvements.

Cannot Reverse

Current.

THE ZUCKER & LEVETT CHEMICAL CO., Gen. Agents,
Manufacturers and Importers of NICKEL PLATERS' SUPPLIES.

540, 542, 544 & 546 WEST 16TH STREET, N. Y.



Cuyahoga Falls,
Ohio.

Tinned
Belt Rivets

AND
Burrs a Specialty.

EASTERN AGENTS,
Alford, Ward, Davenport & Co.,
85 Chambers St., New York.

V. G. HUNDLEY,
PROPRIETOR OF
NORTH CAROLINA HANDLE CO.,



MANUFACTURER OF
Handles and Spokes,
79 Hodge Street and 97 Chambers Street,
HARDWARE COMMISSION MERCHANT. NEW YORK.

B. KREISCHER & SONS,
FIRE BRICK.

BEST AND CHEAPEST.

Established 1815.

Office, foot of Houston Street, East River,
NEW YORK.

NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

English, Scotch and Welsh

FIRE BRICKS,

Dinas and Silica Bricks
for Glass and Steel Works.

S. A. RIMINGTON,

40 and 42 Broadway, New York.
Yard foot of 4th St., Hoboken, N. J.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK

And Furnace Blocks

DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

BORGNER & O'BRIEN,

Manufacturers

FIRE BRICK

AND

Edge Pressed Furnace Blocks,
CLAY RETORTS, TILES, &c.,

Twenty-third Street,

above Race, PHILADELPHIA.
Twenty years' practical Experience.

WATSON FIRE BRICK CO.,

ESTABLISHED 1836.

Successors to JOHN R. WATSON, Perth Amboy, New Jersey
Manufacturers of

FIRE BRICK,

FOR ROLLING MILLS, BLAST FURNACES, FOUN-
DRIES, GAS WORKS, LIME KILNS, TANNERIES,
BOILER and GRATE SETTING, GLASS WORKS, &c.
Fire Clays, Fire Sand, and Kaolin for Sale.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay

Retort Works,

Manufacturer of FIRE BRICK, HOLLOW
BRICK AND CLAY RETORTS.

WORKS: PERTH AMBOY, NEW JERSEY

Office & Depot 418 to 422 East 23d St., N. Y.

TROY FIRE BRICK WORKS,

Troy, N. Y.

JAMES OSTRANDER & SON,

ESTABLISHED 1848,

Manufacturers of

FIRE BRICK,

Turners, Tiles, Blast Furnace Blocks, &c. Miners and
Diggers. Woodbridge Fire Clay and Sand, and Staten
Island Kaolin.

Established 1864.

GARDNER BROTHERS,

Manufacturers of

STANDARD SAVAGE FIRE BRICK,

TILE & FURNACE BLOCKS,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings, and
Miners and Shippers of Fire Clay.

Office: 116 Smithfield St., Pittsburgh, Pa.
Works: Mt. Savage Junction, Md., and Lockport, Pa.

HALL & SONS,

FIRE BRICK,

Buffalo, N. Y.

CHAS. D. COLSON,

FIRE BRICK,

Foundry Facings, Sand, Tools and Supplies.

CHICAGO, ILL.

UNION MINING COMPANY,

Mount Savage Fire Brick.

EDWARD J. ETING, Agent,

230 South Third St., Philadelphia, Pa.

DENNIS & CO.,

Manufacturers and Dealers in

INLAID FLOOR,

WOOD CARPETING,

WEATHER STRIPS,

WIRE SCREENS and MOULDINGS.

167 Madison Street, CHICAGO.

Factory, 337 and 339 W. Lake Street.

Steel.
R. H. WOLFF & CO.,
 MANUFACTURERS OF
Steel Wire

For All Purposes.
Special Finest CAST STEEL WIRE,
 MARKET STEEL WIRE, PRIME COPPERED SPRING WIRE, TEMPERED AND
 UNTEMPERED STEEL WIRES, IN LONG LENGTHS, FOR CRINOLINE, CORSET,
 LOCK AND BRUSH MAKERS, AND ALL SPECIAL PURPOSES.

ALL KINDS OF FURNITURE SPRINGS.
 IMPORTERS OF
IRON STEEL, & RAILS
 OF EVERY DESCRIPTION.

WIRE RODS, PLAIN AND GALVANIZED WIRES, &c.,
 GUN BARRELS, MOULDS, AND ORDNANCE.
 Shipments in bond from American Ports and direct from Europe to all parts of the World.
EXPORTERS AND GENERAL MERCHANTS.

WORKS, PEEKSKILL, N. Y.
 Direct all communications of the
OFFICE & WAREHOUSE, 93 John St., New York.

MILLER, METCALF & PARKIN,
 Pittsburgh, Pa.,
 Manufacturers of

CRESCENT STEEL,

In Bars, Sheets, Cold-Rolled Strips, &c.
 Polished, Compressed Drill Rods and Wire.
 Warranted equal to any imported in quality, finish and accuracy.
 Also Common Grades.

Established 1810.
J. & RILEY CARR,
 SHEFFIELD, ENGLAND.

Manufacturers of the "Celebrated"
"DOG BRAND" FILES.
 Also of Superior
STEEL

For Drills, Cold Chisels, Tools, Taps, Dies, &c.
 COLD ROLLED STEEL for Clock Springs, Corsets, &c.
 SHEET CAST STEEL for Springs, Saws, Welding and Stamping Cold, &c.
 GERMAN, MACHINERY, ENGLISH AND SWEDISH SPRING STEEL,
 and all other descriptions for machinists and agricultural purposes.
 Warehouse, 30 Gold Street, New York.
 Near John Street. HENRY MOORE, Agent.

S. & C. WARDLOW,
 Sheffield, England,
 Manufacturers of the Celebrated

Cast and Double Shear STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives,
 Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.
 Warehouse, 95 John Street, New York.
 WILLIAM BROWN, Representative.

Cleveland Rolling Mill Co.,
 Manufacturers of
BESSEMER STEEL

Iron Rail and Fastenings,
SPRING STEEL

WIRE OF ALL KINDS,
 Tire, Axles and other Forgings,
 Boiler Plate, Galvanized and Black Sheet Iron, Corrugated Roofing and
 Siding of Siemens-Martin, Bessemer Steel and Iron.
CLEVELAND, OHIO.

Western Agency, New England Agency,
 91 Lake Street, Chicago. 239 Franklin Street, Boston.
 N. D. PRATT, Agent. JOHN WALES & CO., Agents.

THE MIDVALE STEEL CO.,
 NICETOWN, PHILADELPHIA.

Best Warranted Cast Steel for Machinists' Tools,
 Taps, Dies, Punches, Shear Blades, Chipping Chisels and Granite Rock Drills,
 Extra Mild Center Steel, special for Taps;
 ALSO,

MACHINERY AND CAST SPRING STEEL, HEAVY AND LIGHT FORGINGS.
 Warehouse, No. 12 North 5th St., Philadelphia.
 Address A. M. F. Watson, General Sales Agent.

STEEL Gautier Steel.
 See Page 3.

Steel.
NEWARK STEEL WORKS.
 BENJAMIN ATHA & CO.,
 Manufacturers
BEST REFINED CAST STEEL

And grades of Steel specially adapted for Lathe Tools, Chisels and Taps and Dies.
 Warranted most superior for TOOLS AND GRANITE ROCK DRILLS.

A full assortment of this universally approved OLD BRAND and other Steels for sale by
EDWARD FRITH & SON, Agents,
 No. 241 Pearl St., New York.

LABELLE STEEL WORKS.
SMITH, SUTTON & CO.,
 MANUFACTURERS OF ALL KINDS OF

STEEL.

Also Springs, Axles, Rake Teeth, &c.
 OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny,
 Post Office Address, Pittsburgh, Pa.
 Represented at Boston by WETHERELL BROS., 31 Oliver St.; at Philadelphia by JAMES C. HAND & CO.,
 614 and 616 Market St.; at Cleveland by CONNIF, WICK & CO., 133 Water St.

ALBANY & RENSSLAER IRON & STEEL CO.,
 Troy, N. Y.,
 Office in New York City, 56 Broadway,

MANUFACTURERS OF

BESSEMER STEEL RAILS,
 Machinery Steel, Merchant and Ship Iron.
HORSE SHOES.

SAM'L G. B. COOK & CO., Agents for Southern States,
 67 and 69 German Street, Baltimore, Md.

FRANCIS HOBSON & SON
 97 John Street, NEW YORK,

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.
 CHAS. HUGILL, Agent.

GEO. SANDERSON & CO.,
 MANUFACTURERS AND

Importers of STEEL,

Removed to 30 Gold Street, New York.

Particular attention is paid to quality and temper for FILES, SAWS, EDGE TOOLS,
 TABLE and POCKET CUTLERY, TOOLS, TAPS and DIES; also for COLD ROLLED STEEL for
 CLOCK SPRINGS, CORSET CLASPS, &c.

A Large Assorted Stock of JOHN ROTHERY'S FILES always on hand.
 Warranted Superior to any Steel in the Market, either
 English or American, for every purpose.

Also,
 Combination Chrome Steel and Iron for
 Safes, Jails and Deposit Vaults.

Send for Circular
 and
 Price List.

CHROME CAST STEEL.

Chrome Steel Works
 Kent Avenue and Keap Street,
 BROOKLYN, E. D., N. Y.

Chicago Branch,
 40 Dearborn Street,
 Cincinnati Branch,
 123 Central Avenue,

JOLIET STEEL COMPANY,
 MANUFACTURERS OF

Steel Rails,
 ALL WEIGHTS.

The Company warrant its Rails equal in quality to any manufactured in the
 United States.

ALEX. J. LEITH, President, H. B. SMITH, General Supt.
 W. R. STELLING, Treasurer, JOLIET.
 C. E. SARGEANT, Secretary, Works, Joliet, Ill.

Office, Rooms D and E, Honore Building.

GUTE HOFFNUNG'S HUTTE,
 (Works of Good Hope.)

Established 1781. OBERHAUSEN, ON RUHR. 8500 men employed.

BRAND:

G. H. H.

STEEL RAILS, STEEL WIRE RODS,
 STEEL BLOOMS, SPIEGELEISEN,
 FERROMANGANESE UP TO 80 PER CENT.

GODEFFROY & CO., Sole Agents for the United States,
 43 New Street, NEW YORK.

Steel.
R. MUSHET'S
Special Steel

FOR
LATHES, PLANERS, &c.

Turns out at least double work by increased speed
 and feed, and cuts harder metals than any other
 Steel. Neither hardening nor tempering required.
 Sole Makers,

SAMUEL OSBORN & CO.,
 Sheffield, England.
 Represented in the United States by
B. M. JONES & CO.,
 Nos. 11 & 13 Oliver Street, BOSTON.

NAYLOR & CO.,
 99 John St., New York. 6 Oliver St., Boston, Mass.

W. R. HART, Agent,
 205 S. Fourth St., Philadelphia, Pa.

IMPORTERS OF
STEEL AND IRON RAILS,
 Tin and Terne Plates,
 Swedish and Norway Iron,

BESSEMER STEEL WIRE RODS,
 Pig Iron, Spiegeleisen, Ferroman-
 ganese, Scrap Steel and Old
 Iron Rails.

MANUFACTURERS OF
STEEL COMPRESSED SHAFTING,
 "Benzon" Homogeneous Plates

For Boilers, Fire-boxes, &c.

Axles, Crank Pins, Spring Steel,
 And all other kinds of

Martin-Siemens Steel and Iron
 For Railroad purposes.

BUDD & ELLIS,
 New York, 23 Cliff St. 10 Oliver St., Boston,

Sole Agents for the United States for
Langlois Scotch Pig Iron,

Commission Merchants and Dealers in
 All Descriptions of Iron and Steel, Rail-
 road Equipment and Supply.

Importers of
SILESIA SPALTER & METALS.
 Sole Agents for the United States of the Union
 Co. of Dortmund, makers of Steel Rails, Blooms, &c.

THOS. FIRTH & SONS, Ltd.
 Sheffield,

Crucible Cast Steel.

JERE. ABBOTT & CO.,
 Agents and Importers of

SWEDISH IRON.
 35 Oliver St., Boston. 23 Cliff St., New York.

REYNOLDS, CARTER & REYNOLDS
 3 Clements Lane,

Lombard Street, LONDON, E. C.

Cable Address:

REYNOLDS,
 London,

Iron and Steel Merchants

AND
ENGINEERS.

Exporters of
 Iron and Steel Rails, Blooms, Spiegeleisen,
 Pig Iron, Old Rails, Scrap Iron, Iron Ore,
 and all kinds of Railway Plants,
 Engines and Piping for Water-
 works, Mining Machinery, &c.

EMPIRE STATE MFG. CO.
 BUFFALO, N. Y.

Copper,
 Half Copper,
 Nickel Plated
TEA KETTLES.
 Metal Spinning.

A. PARDEE & CO.

237 South Third St.,
 PHILADELPHIA,

No. 111 Broadway, New York.

MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh
 Coals are mined by ourselves and firms connected
 with us, viz.

A. Pardee & Co. { HAZLETON,
 CRANBURY,
 SUGAR LOAF.

Pardee, Bro. & Co. LATTIMER.

Calvin Pardee & Co. HOLLYWOOD.

Pardee, Sons & Co. MT. PLEASANT.

Steel.

CARNEGIE BROS. & CO., LIMITED,

THOS. M. CARNEGIE,
Chairman.

PITTSBURGH, PA.

D. A. STEWART,
Treasurer.

EDGAR THOMSON STEEL WORKS DEPARTMENT.

Works at Bessemer Station, P. R. R.

Branch Office and P. O. Address, 48 Fifth Ave.,

MANUFACTURERS OF

STEEL RAILS, BLOOMS & INGOTS

OF SUPERIOR QUALITY.

Union Iron Mills Department

Mills at Thirty-third St. and A. V. R. R.

Branch Office and P. O. Address, Thirty-third St.

MANUFACTURERS OF

STRUCTURAL IRON.

Bridge Iron, Iron Beams, Channel Bars, Car Truck Channels, Angles, Tees,
Universal Mill Plates, Bar Iron, Light Steel and Iron Rails.

Special attention given Unusual Shapes and Sizes.

Lithographs of sections and book of detailed information giving calculation of strain, &c., furnished
to Engineers and Architects on application.

NEW YORK OFFICE: Room 32, No. 55 Broadway, N. Y.

NORTH CHICAGO ROLLING MILL CO.

ESTABLISHED 1857.

CAPITAL, \$3,000,000.

INCORPORATED 1860.

Works at Chicago, Ill., and Milwaukee, Wis.

MANUFACTURERS OF

MERCHANT BAR, FISH PLATES, PIG METAL,
IRON RAILS & BESSEMER STEEL RAILS.

| | |
|---|-------------|
| Present Annual Capacity of these Works. | 13,000 tons |
| Fish Plates..... | 40,000 " |
| Pig Metal..... | 100,000 " |
| Iron Rails..... | 110,000 " |
| Steel Rails..... | 100,000 " |
| Total Capacity per year..... | 350,000 " |

OFFICES.

17 Metropolitan Block, Chicago, Ill.
37 Mitchell Block, Milwaukee, Wis.O. W. POTTER, President, CHICAGO.
N. THAYER, Jr., Vice President, Boston.
S. CLEMENT, Treasurer, MILWAUKEE.
R. C. HANNAH, Secretary, CHICAGO.

THE MONTGOMERY IRON & STEEL COMPANY.

WORKS AT DANVILLE, PA.

PIG IRON, T AND STREET RAILS.

A general assortment of mine and narrow gauge rails kept on hand, from which shipments can be
made promptly.W. E. C. COXE, President,
Reading, Pa.S. W. INGERSOLL, Treasurer,
208 South Fourth St., Philadelphia, Pa.

HUGH McNEILL, Chairman.

JNO. C. PORTER, Sec'y and Treas.

THE

SPANG STEEL AND IRON CO., Limited,

MANUFACTURERS OF

OPEN HEARTH STEEL,

BLOOMS, FLAT BAR, BILLETS, ROUNDS, AND ANGLES, SQUARES.

Steel for Agricultural and other Purposes.

UNIVERSAL MILL PLATES

Of Steel and Iron, up to 30 inches wide, and of any desired thickness and length.

Address, PITTSBURGH, PA.

THE CLEVELAND
CRUCIBLE
STEEL CO.Manufacturers of
TOOL,
MACHINERY,
SPRING,
TIRE,
STEEL
CLEVELAND,
OHIO.Warranted equal to
any made.

THE PITTSBURGH BESSEMER STEEL CO.

(LIMITED),

STEEL RAILS

P. O. ADDRESS:

87 Wood Street, Pittsburgh, Pa.

JARVIS PATENT FURNACE

For Setting Steam Boilers.

Economy of Fuel, with increased capacity of steam
power.
The same principle as the SIEMENS PROCESS OF MAKING
STEEL; utilizes the waste gases with hot air on top of the fire.
Will burn all kinds of Waste Fuel without a blast, including
screenings, wet peat, wet hops, sawdust, logwood chips,
slack coal, &c.
Send for circular.A. F. UPTON, General Agent.
7 Oliver Street (P. O. Box 341), BOSTON, MASS.

American Tool Co.,

Manufacturers of
TOOL CHESTS OF ALL SIZES.
Adapted for the use of Boys, Youths, Gentlemen, Farmers,
Plumbers, Carpenters, Railroads and Mines;
fitted up complete with a superior quality of Tools, and
suited to the wants of the Hardware, Toy, Station and
Variety trades. Export trade solicited, and a full stock
of large-sized Chests always on hand. Quality con-
sidered, we think our goods will be admitted by buyers the
cheapest that have yet been offered by any manufacturer in
the United States or Europe. Illustrated descriptive catalogue
furnished free on application with prices.
MECHANICS' TOOLS AND HARDWARE SPECIALTIES, &c.
Warehouse and Salesroom, 116 Chambers St., New York, U. S. A.
Factories, 200, 214, 218 W. Houston St. near Varick.SOLD
EVERYWHERE.
MANUFACTURED ONLY BYST. LOUIS STAMPING CO.,
ST. LOUIS, MO.
NEW YORK OFFICE, 57 Beekman St.
List on Application.

ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 44a CANNON STREET, LONDON, E. C.

ADVERTISEMENTS AND SUBSCRIPTIONS ARE RECEIVED AT THE VARIOUS OFFICES OF "THE IRON AGE," NAMELY:

NEW YORK OFFICE: DAVID WILLIAMS, Publisher of The Iron Age, 83 Reade street, who will, on receipt of application, supply
specimen copies free.PITTSBURGH OFFICE: 77 Fourth Avenue—JOS. D. WEEKS,
Manager and Associate Editor.
PHILADELPHIA OFFICE: 220 South Fourth Street—THOMAS
HOBSON, Manager.CINCINNATI OFFICE: Builders' Exchange—T. T. MOORE,
Manager.
SOUTHERN OFFICE: Cor. Eighth and Market Streets, Chat-
anooga, Tenn.—S. B. LOWE, Manager.

SPECIAL FEATURES.

Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to
week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.Special Correspondents.—The Ironmonger has a deserved reputation for its special correspondence from all the principal Continental, British
and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities
for acquiring information specially suited for the columns of the Ironmonger. The Week, Legal News, Trade Notes, Bankruptcies, Foreign
Notes, Colonial Findings, Merchants' Circulars, &c., are each departments of the journal containing a digest of all matters of direct interest
to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French,
Belgian and other Special Correspondence.

SUBSCRIPTIONS

to the Ironmonger and Metal Trades Advertiser, with which is sent every fourth week the Foreign Supplement (see below), may commence from any
date, but are not received for less than a year complete. The rate is \$5 per annum, inclusive of postage to any part of the world outside Great Britain.
To every subscriber is presented, free, in the course of his year, a handsome and useful Ironmongers' Diary and Text Book, a work sold to non-
subscribers at 75 cents.

ADVERTISEMENTS

are inserted in the Ironmonger and Metal Trades Advertiser at the subjoined rates, from which no variation can be made on any ground whatever.

Size of Page—Nine Inches Deep by Six Inches Wide.

One Advertisement of every Series of 13 Monthly, 27 Fortnightly, or 53 Weekly, will be inserted in
the Ironmongers' Diary and Text Book, published toward the end of each year,
and presented to every Subscriber.

| | 53 INSERTIONS, each net. | 27 INSERTIONS, each net. | 13 INSERTIONS, each net. | 7 INSERTIONS, each net. | 3 INSERTIONS, each net. | 1 INSERTION, net. |
|-------------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------|
| One page..... | Gold. \$20.00 | Gold. \$22.50 | Gold. \$25.00 | Gold. \$30.00 | Gold. \$35.00 | Gold. \$50.00 |
| Two-thirds page..... | 15.00 | 16.00 | 18.75 | 22.50 | 26.25 | 37.50 |
| Half page..... | 11.00 | 12.40 | 13.75 | 16.50 | 19.25 | 27.50 |
| One-third page..... | 8.00 | 9.00 | 10.00 | 12.00 | 14.00 | 20.00 |
| Quarter page..... | 6.40 | 7.25 | 8.00 | 9.60 | 11.20 | 16.00 |
| One-sixth page..... | 4.50 | 5.10 | 5.65 | 6.75 | 7.75 | 11.40 |
| One-eighth page..... | 3.60 | 4.10 | 4.50 | 5.40 | 6.25 | 9.00 |
| One-sixteenth page..... | 2.00 | 2.25 | 2.50 | 3.00 | 3.50 | 5.00 |

SPECIAL ISSUES.

In the spring and autumn of each year there is published a Special Issue, the circulation of which is not less than Twelve Thousand (12,000) copies

THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual, presented free to every Subscriber to the IRONMONGER AND METAL TRADES ADVERTISER.
It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to
year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of excep-
tional value for advertisements. Sold to non-subscribers at 75 cents.

THE FOREIGN SUPPLEMENT,

With which is incorporated The Universal Engineer,

Is published every fourth week in connection with the extensive and world-wide circulation of the Ironmonger itself. The dates of its publication for the
next twelve months will be as follows:
MARCH 25, APRIL 22, MAY 20, JUNE 17, JULY 2, AUGUST 5, SEPTEMBER 2 and 30, OCTOBER 28, NOVEMBER 25, DECEMBER 23, 1882.
JANUARY 30, and FEBRUARY 17, 1883.

This Supplement is published in

FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the Ironmonger not only within reach
but in the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish
speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to
be found.

Advertisements are inserted in any language at the following

MODERATE TARIFF.

Size of Page—13½ inches Deep by 9½ inches Wide.

| | 13 INSERTIONS, each net. | 7 INSERTIONS, each net. | 3 INSERTIONS, each net. | | 13 INSERTIONS, each net. | 7 INSERTIONS, each net. | 3 INSERTIONS, each net. |
|----------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------|--------------------------------|-------------------------------|-------------------------------|
| One page..... | Gold. \$30.00 | Gold. \$33.75 | Gold. \$37.50 | Quarter page..... | Gold. \$10.00 | Gold. \$11.25 | Gold. \$12.50 |
| Two-thirds page..... | 22.00 | 24.75 | 27.50 | One-sixth page..... | 7.50 | 8.45 | 9.40 |
| Half page..... | 17.00 | 19.15 | 21.25 | One-eighth page..... | 6.20 | 7.00 | 7.75 |
| One-third page..... | 12.50 | 14.10 | 15.65 | One-sixteenth page..... | 3.20 | 3.40 | 4.00 |

Advertisers will do well to use illustrations freely. Where economy of space is an object, a left page illustrated and described in one language can
be suitably described in four or more languages on the opposite or right page without illustrating.

THE WHOLE FOREIGN HARDWARE TRADE

so far as our experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Adverti-
ment inserted in the Ironmonger and Foreign Supplement is a strikingly powerful and most efficient way of publicity not to be compared with any of the
other ordinary channels of communication.

HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

Front and Laurel Streets,

PHILADELPHIA.

DISSTON'S SAMSON TREE PLANTER AND POST HOLE DIGGER.

Fig. 1.

Patented May 29, 1870.

Fig. 2.

Price, - - - \$37.50 per dozen.

No Farmer, Nurseryman, Railroad
or Telegraph Company
SHOULD BE WITHOUT ONE.

NO BACK-ACHE.

NO KNEE-WORK.

NO CLOGGING.

This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all plungers, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the soil anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.

HENRY DISSTON & SONS.

BROWER & LEEDS,

No. 81 Murray Street, New York.

Hardware Manufacturers' Agents, and Headquarters for

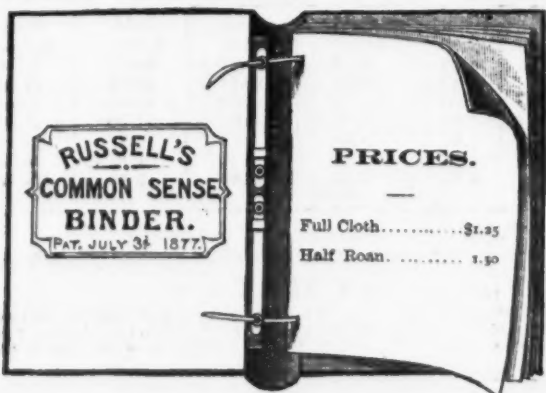
HORSE SHOES, HORSE NAILS, TOE CALKS, CALKING STEEL,

Bayliss' Bellows, Forges and Tuyeres,

Horseshoers' Pincers, Sledges,

FITTING AND DRIVING HAMMERS.

SELF-BINDERS FOR THE IRON AGE.



We are now prepared to supply our subscribers with an excellent self-binder for their papers, a cut of which is annexed. We call attention to the low prices at which it is offered.

Address all orders to
DAVID WILLIAMS,
83 Reade Street,
NEW YORK.

MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,
Beach's Patent Self-Centering Chuck, Solid and Shell Reamers,
BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL
PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER
AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS.
DRILL GRINDING MACHINES. TAPER REAMERS, MILLING
CUTTERS AND SPECIAL TOOLS TO ORDER.

All Tools exact to Whitworth Standard Gauges.

GEO. R. STETSON, Supt.

EDWARD S. TABER, Treas.

JOHN SOMMER'S SON, 8, 10 & 12 Pearl St., Newark, N. J.

WOODEN FAUCETS.

Cork Lined, first quality, warranted. Metallic Key, Lignumvite Key, Rosewood, Red Cedar, Cherry and Butternut Faucets. John Sommer's Metallic Key and First Quality Cork Lined Faucets are the best. Send for catalogue.

The Most Durable and Best Selling Bucket for Chain Pumps.

It has no valves to become obstructed and no screw joints to become immovable by rust. Advantages of the Crosby Bucket over all others:—1. It has an air chamber on top, which conducts the air to the bottom of the well. 2. It is self-expanding, the base of the bucket being 1/4 of an inch larger at the bottom than bore in the tubes, which allows it to expand, and the wear comes on the side to contract. 3. The wear comes on the whole side, and not on the extreme edge like other buckets. 4. It contains more solid rubber than three of any other manufacture. Three sizes—1/4 inch for deep wells, 1/2 inch for 40 feet or less, 3/4 inch for stock pumps. No charge for Territorial Rights. NONE GENUINE unless A. D. Crosby appears in raised letters on base of each bucket. Send for Price List. Agents wanted in every county. Address A. D. Crosby, Patentee and General Agent, Cuba, Allegheny county, N. Y. For Sale by W. & B. Douglas, 45 and 57 John St., N. Y., and all General Hardware and Pump Dealers.

Something Practical at Last!
WATERS' Improved TREE PRUNER.
E. S. Lee & Co.
Sole Manufacturers, ROCHESTER, N. Y.
We are now exclusive manufacturers of this celebrated Tree, Shrub and Hedge Trimmer. Special inducements to buyers for export. Send for our illustrated circular and price list. E. S. LEE & CO., ROCHESTER, N. Y.

GLADWIN IMPROVED BIT OR AUGER.
This Bit will bore through all hard, knotty or gummy woods without being sidetracked. The worm will not clog, owing to the continuance of the channel of the Bit to the extreme point of the worm, enabling it to cut its way and clear itself of shavings, but not injuring its qualities as a screw. This improvement is applicable to any size Auger or Bit having a worm or spur. Dealers, send for price list for setting stock on hand (stating quantity and sizes) and for the Gladwin Bits.
GARDNER & CHANDLER, Gen'l Agents,
1341 Washington St., Boston, Mass.

209 & 211 Collect St. BURLINGTON, VT.

PORTER MANUFACTURING COMPANY.

MANUFACTURERS OF: ORNAMENTAL, USEFUL, DURABLE, CHEAP.

PORTER'S PATENT WINDOW & DOOR SCREEN CORNERS ETC.

EVERY ONE HIS OWN WINDOW & DOOR SCREEN MAKER. NO MORTISING OR TENONING, CANNOT SAG OR WARP. AND ANYONE CAN MAKE THEM. SEND FOR PRICE LIST.

NEW YORK, N.Y. CHICAGO, ILL. GRAHAM & HAINES, 113 CHAMBERS ST. W. PICKETT & SON, 164 LAKE ST.

PEERLESS SPRING BUTTS AND DOOR SPRINGS.

Our Bronze
SPRING BUTTS

ARE THE
HANDSOMEST

In the market.

WE MAKE

ALL SIZES OF

COIL SPRINGS.

Nos. 6, 7, 8 and 9.

TORREY ROD SPRINGS.

TORREY ROD COIL SPRINGS

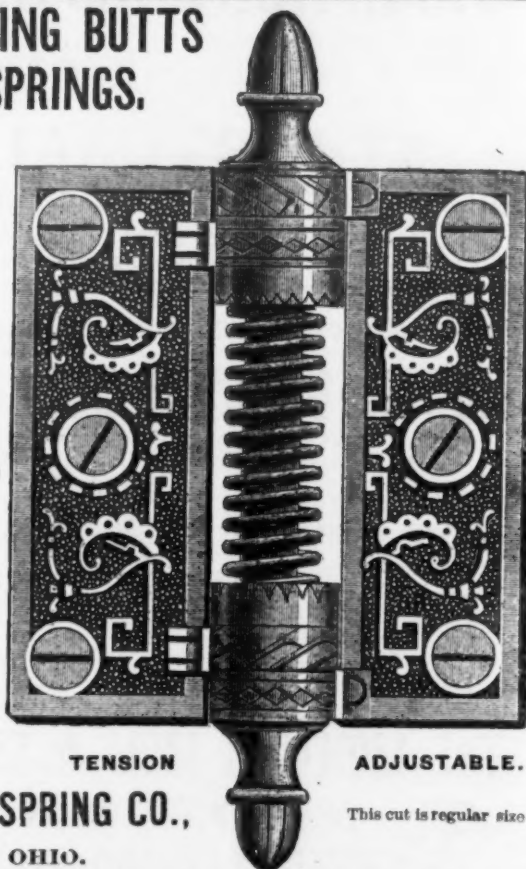
(NEW).

Send for Illustrated Circular and Price List.

Liberal Discount to the Trade.

PEERLESS DOOR SPRING CO.,

CINCINNATI, OHIO.

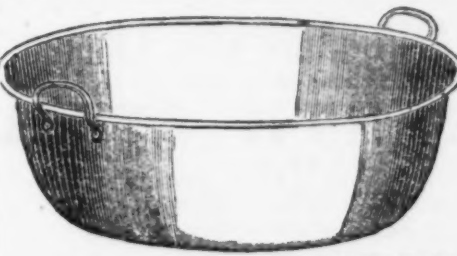


TENSION

ADJUSTABLE.

This cut is regular size

SIDNEY SHEPARD & CO., THE BUFFALO STAMPING WORKS.



STAMPED & JAPANNED TIN WARE

Reinforced Ware, Plain Piced Tin Ware, Bathing Apparatus, Toilet Ware, Tin Toys, Spoons, Forks, Cake Turners, Coal and Fire Shovels, Pokers, Fry Pans, Stove Skillets, Coal Hods, Coal Vases, Water Coolers and Filters, Harness Oil Cans, Soldering Coppers.

Dripping Pans, Elbows, Milk Cans and Fixtures, Roofing Nails, Steve Boards, Transportation Cans, Buffalo Champion Ice Cream Freezers.

PERFORATED SHEET IRON FOR PAPER MANUFACTURERS AND MALT KILNS.

Grocers', Druggists' and Spice Mills' Tin Ware a Specialty.

Also, A LARGE LINE OF MISCELLANEOUS HOUSE FURNISHING HARDWARE.

Send for Illustrated Catalogue. Address,

SIDNEY SHEPARD & CO.,

Buffalo, N. Y., or Chicago, Ill.

THE "MOUNT CARMEL" OX SHOE.

Steel Toe Calk.
FINISHED READY FOR NAILING ON.
WARRANTED
The Best and Cheapest Shoe Made.
IVES, WOODRUFF & CO.
Manufacturers,
MOUNT CARMEL, CONN.
For sale by dealers in blacksmiths' supplies.

NOVELTY IRON FOUNDRY. HAIGHT & CLARK, 16 & 18 De Witt St., Albany, N. Y.

Manufacturers of
FINE GRAY IRON CASTINGS OF EVERY DESCRIPTION.
Rosettes and Pickets for Wire Workers, Castings for Furniture and Piano Manufacturers. Iron and Metal Patterns of all kinds a specialty.
Correspondence solicited for JAPANNING, COPPERING, BRONZING.

PURE TURKISH EMERY,

Quartz, Pumice and Rotten Stone, Crocus, Rouge, Glue, Sand Paper, Emery Paper and Cloth, Emery Wheels, &c.

WALPOLE EMERY MILLS,

Mills, So. Walpole. 114 MILK ST., BOSTON, MASS.

BARREL AND STAVE MACHINERY.

The best in the world.
For circulars, address
H. A. CROSSLEY,
CLEVELAND, O.

| | |
|---|--------|
| Cutlery, Pocket, American Shear Co's. | ds 40 |
| Butcher Knives, Wood's, Lap Solver. | ds 20 |
| Square Handle. | ds 30 |
| Steel Knives, Wood's. | ds 25 |
| Lap Solver, Oval Handle. | ds 20 |
| Skinner. | ds 20 |
| Butcher, Common Round Handle, Wood's. | ds 20 |
| Shoe Knives, Wood's. | ds 20 |
| Dividers, Cook's. | ds 25 |
| Dog Collars, Automatic. | ds 25 |
| Dog Muzzles. | ds 10 |
| Dog Springs—Torrey's Rod. | ds 20 |
| Imitation Torrey's Rod. | ds 14 |
| Gem Coll, new list. | ds 25 |
| Crowed. | ds 20 |
| Warner's. | ds 20 |
| Door Stops—Thurston's. | ds 50 |
| Drawer Knobs—Thurston's. | ds 50 |
| Drills—Morse Hit Rock. | ds 15 |
| Morse's Hit Rock. | ds 15 |
| Emery—Wellington Mills. | ds 10 |
| Walpole Emery Mills. | ds 10 |
| Turns in 2 cuts. | ds 10 |
| Enamelled Ware. | ds 20 |
| Standard Mfr. Co. Kettles. | ds 10 |
| Standard Sauce Pans. | ds 25 |
| Fellow Pintes—Wrought. | ds 10 |
| Fines, American File Co. | ds 40 |
| Schuchman File Co. | ds 40 |
| Fluting Machines—Knox list, \$4.75. | ds 25 |
| American list, \$3.40. | ds 25 |
| Forks—W. C. Co., Manure. | ds 50 |
| Ginnet Bits. | ds 10 |
| Genuine German, No. 125, 132 to 132, per doz. | \$1.25 |
| Pierce's. | ds 10 |
| Glass Cutters—Combination Glass Cutter and | ds 100 |
| Grub Hoe, Co. No. 2. | \$1.50 |
| Hammer—Mayfield's. | ds 25 |
| Hartford Hammer Co's. | ds 25 |
| Hangers & Rollers—Anti-Friction. | ds 50 |
| Climax. | ds 50 |
| Common Hangers. | ds 50 |
| Common Hangers. | ds 50 |
| Hand Screws. | ds 50 |

T. NEW'S PREPARED ROOFING

**THE DETROIT
LUBRICATOR MFG. CO.'S**

**CONTINUOUS FEED
Lubricator Cups**

For oiling valves and cylinders of
steam engines by the only perfect

Through the Steam Pipe

The oil passes in *sight*, drop through the column of steam where it vaporizes, thus becoming a *steam lubricant*, oiling perfectly, every part reached by the steam. Any dense oil, black or white, light or heavy, may be used. Saved from so to 50 per cent in cost of wear of machinery, thus paying for itself several times a year.

A drop will be sufficient to give particles on twenty days' trial. If desired, in ordering specify diameter of cylinder.

NOTICE.—The trial indicators ever made, showing the oil passing drop through a transparent tube, have been made by others, and are fully embraced by many Letters Patent owned and controlled by us. Lubricators of every nature embodying the above method made by others are encroachments upon our rights, and we will hold ourselves bound to sue such encroachers, responsible in damages for such violations.

Address

DETROIT LUBRICATOR MFG. CO.,
Office, 98 Griswold St., Detroit, Mich.
First Prize at Fair American, Institute and Millers'

International Exposition, Cincinnati, 1881.

Now in our receipt list against the American Lumber Co., of Detroit, before the State of Michigan, the U. S. Supreme Court, involving their slight-feed feature, a decree was rendered in our favor August 20, 1881.



THE MILLER CO.,
Manufacturers of the
Torment and Unique
STEAM PUMPS
For Boiler Feeding.
CANTON, OHIO.

For Engines from 5 to 120 H. P. with bracket or base on smaller sizes.
Price, \$30 and Upwards.
 Inexpensable for Engines of all kinds.
 Send for Catalogue.

PUNCHING & SHEARING PRESSES.

Power, Foot or Hand

PUNCHES,
 AND
SHEARS.

All sizes, from \$25 to \$3000.

Peerless Punch & Shear Co.,
 115 W Liberty Street,
 NEW YORK CITY.

DRILL PRESSES.

New Universal Power Drill Presses; swing as inches, back geared, quick return motion; large steel Spindle, balanced in column; revolving Arm and Table; cut Gears; Pulleys, 9 x 24; a strong brace extends from base to column, stiffening it at point of greatest strain. — a new feature. Weight, 100 lbs.; height, 6 feet. Price, \$60. Small size, swing 12 in., lever feed, three speeds; light and loose pulleys (no counter-shaft required). Price, \$35.

Peerless Punch & Shear Co.

115 W. Liberty Street, New York.


BAR IRON SHEARS
Hand Lever Shears, cutting Flat Bar

100, 3/4 x 1 1/2, 5-8 X 3, 1-2 X 4, and 1 1/2 inch
 round, smoothly, leaving good ends;
 weight, 375 lbs.; reduced price, \$65, net.
 Also, smaller sizes.

These are the most powerful Bar Iron
 Shears for Blacksmith work ever in-
 vented, while in entire price
 they are below any
 shear of equal capa-
 city in the market.

**ENDLESS PUNCH AND
 SHEAR CO.,**

215 W.
 Liberty St.,
 New York.



| Potman Pointed | 28 | 29 | 34 | 34 | 30 |
|--|----|----|----|----|-------------|
| Hoosie Nails.—Bridgewater. | | | | | dis 25 |
| 1/2 doz. 7 1/2 No. 8, 8 1/2 No. 5, 10. | | | | | do 25 |
| Ice Cans. —Freezers.—Brockton, new list, dis 25 | | | | | do 25 |
| Kerosene. —Norwalk. New list. | | | | | dis 40 |
| Silver Glass | | | | | dis 50 & 80 |
| Silver Glass Bell Pulls. | | | | | dis 50 & 80 |
| Lanterns. —Guarded, No. 99. | | | | | 5 doz 87 50 |
| 1 doz. | | | | | do 87 50 |
| Railroad, Oil, No. 43. | | | | | 5 doz 40 |
| 1 doz. | | | | | do 40 |
| Hurricane. | | | | | dis 50 |
| Lawn Mowers. —The "Daisy." | | | | | |
| 12 in. cut. | | | | | each, 85 50 |
| 14 in. cut. | | | | | do 90 |
| 15 in. cut. | | | | | each, 95 |
| 16 in. cut. | | | | | do 100 |
| Lead Sheet. | | | | | |
| 1 lb. | | | | | 5 lb 8 0 |
| 5 lb. | | | | | do 40 |
| Locks. —Norwalk Genuine Bronco Goods. | | | | | dis 40 |
| Eagle Cabinet. | | | | | dis 25 |

| | |
|---|------------------------|
| W. Williams & Co., Padlocks..... | dis 13 |
| Manure Forks—W. C. & Co..... | dis 30 |
| Nails. | |
| E. P. & Co., Long Cut, \$15.00 $\frac{1}{2}$ doz..... | dis 30 |
| Short Cut, \$15.00 $\frac{1}{2}$ doz..... | dis 30 |
| K. P. & Co., Pick Cut, \$15.00 $\frac{1}{2}$ doz..... | dis 30 |
| Measuring Tapes—Eddy's..... | dis 30 |
| Meat Cans—Miles' Challenge..... | dis 30 |
| Best of the East..... | dis 30 |
| American..... | dis 25 |
| Money Drawers—Tucker's Am..... | $\frac{1}{2}$ doz \$25 |
| Horse Traps—Delusion..... | doz 2.00 |
| Novelty..... | doz .75 |
| Office and Store..... | $\frac{1}{2}$ doz \$5 |
| Office and Pen..... | $\frac{1}{2}$ doz \$5 |
| Brass and Copper..... | dis 40 |
| Box Rows—Extra finished and varnished..... | dis 15 |
| 14 in. 6 doz. pair, \$7.00 3 in. $\frac{1}{2}$ doz. pair..... | \$10.00 |
| 12 in. 6 doz. pair, \$7.00 3 in. $\frac{1}{2}$ doz. pair..... | \$10.00 |
| Paint—Tard Sheathing..... | doz 2 1/2 |

[illegible][illegible]

| | | |
|---|--------------|----------|
| American Flat-Hoed Iron | new list, | dls 50 s |
| " " " | do do | " 70 s |
| American Round-Head Brass | new list, | dls 25 s |
| " " " | do do | " 25 s |
| American Round-Head Iron | new list, | dls 25 s |
| " " " | do do | " 25 s |
| Cylinders—Clippers, in boxes | \$ doz 90 c | |
| " "—Kimball's | \$ Inch 75 c | |
| Evers—American shear Co., new list | dls 70 s | |
| Father's Patent | do 70 s | |
| Gates—other brands, new list | dls 18 s | |
| R. & D. | dls 15 s | |
| Hanks—Mages Patent | dls 30 s | |
| Saw Shovels—Hallenble's Tips | \$3.00 | |
| Stearns' Union | dls 25 s | |
| Union Club List No. 5, \$3.75 v pair; list No. 7, \$5.00 | dls 25 s | |
| Tacks and Pins—Ainsie's | dls 80 s | |
| " "—A. Field & Son's | dls 30 s | |
| Wedges Tinned | dls 30 s | |
| " " " | dls 30 s | |
| Wedge Tacks | dls 30 s | |

[illegible]


 HENRY
 105 Ch
 New Y

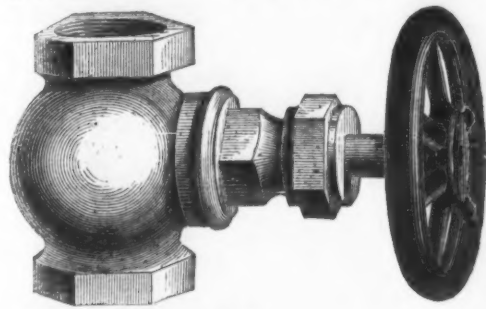

 HENRY
 105 Ch
 New Y

 Phil
 NO
 Carria
 TOWNSE
 MACH
 N
 U
 T
 S
 Cold Punched.


McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS AND VALVES,



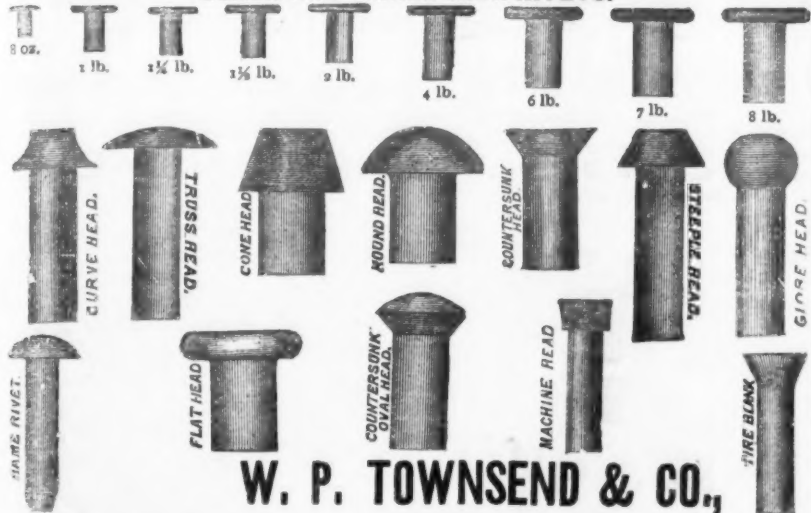
For STEAM,
WATER
and GAS.

WROUGHT IRON
PIPE AND FITTINGS,
PLUMBERS' MATERIALS

Factory, Paterson, N. J.

56 John Street, N. Y.

BLACK AND TINNED IRON RIVETS.



W. P. TOWNSEND & CO.,

PITTSBURGH, PA.,

Manufacturers of every description of First Quality

HENRY B. NEWHALL,
105 Chambers St.,
New York Agent.

RIVETS.



WM. H. HASKELL & CO.,
Pawtucket, R. I.

MANUFACTURERS OF

COACH SCREWS,

(With Gimlet Points),
ALL KINDS OF



Machine and Plow Bolts,

TAP BOLTS.

HENRY B. NEWHALL,
105 Chambers St.,
New York Agent.

STANDARD NUT CO.,

Pittsburgh, Pa.,

MANUFACTURERS OF

HOT PRESSED

Square & Hexagon Nuts,

R. R. FISH BARS,

BOLTS.

SPIKES,

RIVETS, &c.

HENRY B. NEWHALL,
105 Chambers St.,
New York Agent.

Philadelphia "STAR" Bolt Works.

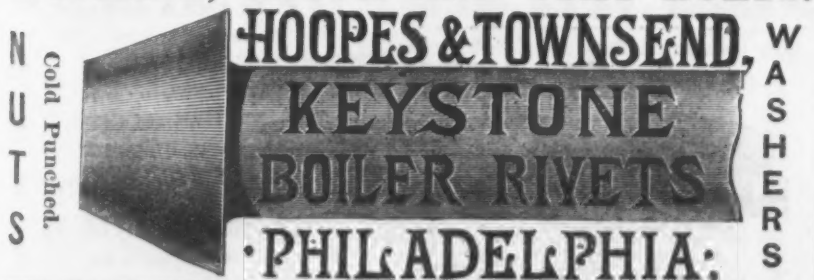
NORWAY IRON

FANCY HEAD BOLTS,

Carriage & Tire Bolts. Star Axle Clips, &c.

TOWNSEND, WILSON & HUBBARD, 2301 Cherry Street, Philadelphia, Pa

MACHINE, PATCH AND STAY BOLTS.



HOOPE & TOWNSEND,
KEYSTONE
BOILER RIVETS
PHILADELPHIA.

WOOD SCREWS, TANK RIVETS, FLAT LINK CHAIN.

BAGNALL & LOUD,

BOSTON, MASS.,

Sole Manufacturers in U. S. A. of our Cele-

brated

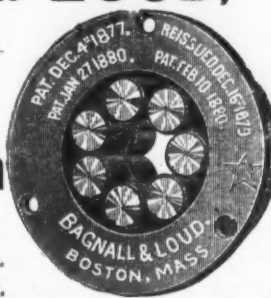
METALINE

AND

Star Roller Bush
Tackle Blocks.

Send For Illustrated Catalogue.

New York Warehouse, 33 South St.



LIGHTNING HAY KNIVES.

WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for exports as well as home trade, and it seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY

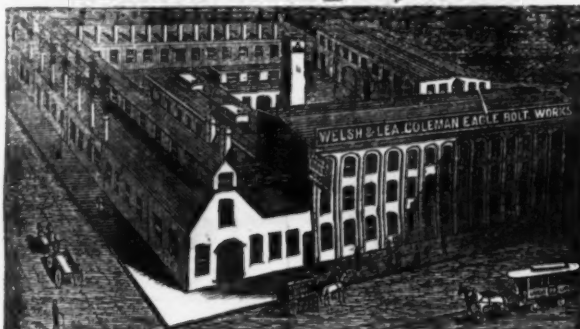
HIRAM HOLT & CO.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

NORWAY IRON CARRIAGE & TIRE BOLTS.

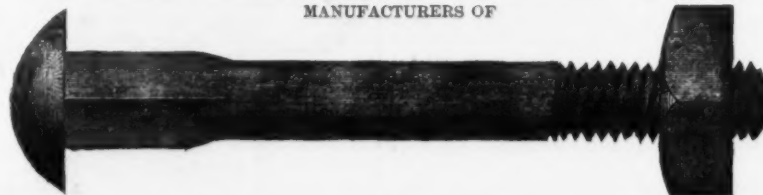
Axle Clips, &c.



COLEMAN EAGLE BOLT WORKS,
WELSH & LEA, Philadelphia, Pa.

F. M. HASLETT & CO.,

MANUFACTURERS OF



Carriage, Machine and Skein Bolts, Lag Screws, &c.

ALLEGHENY, PA.

W. K. ROSS, J. A. FULLER, W. K. FULLER, Sole Agents,
97 Chambers Street, New York.

RIEHLÉ BROTHERS'

Celebrated Patented Furnace Charging Scale.

TAKES HIGHEST PREMIUM WHENEVER EXHIBITED.

INDEPENDENT BEAMS. EACH BEAM IS NUMBERED AND CAN BE SEEN TO OPERATE. POISES ARE KEVED AND CANNOT SLIP. NO JUMPING OUT OF BEAM. NO COMPLICATED JOINTED LEVERS TO RAISE BEAM. NO CROWDING. NO MISTAKE IN LOOKING AT INDICATOR AND USING WRONG BEAM.

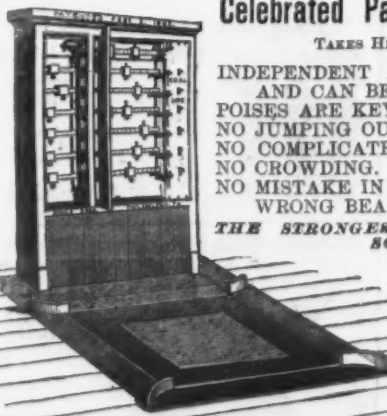
THE STRONGEST AND ONLY PERFECT CHARGING SCALE IN THE MARKET.

and always preferred by experienced furnacemen. Ask any furnaceman. Send for Circulars and Prices.

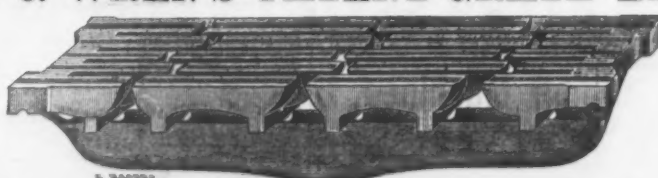
RIEHLÉ BROS.,

Works, 9th above Master. Store, 4th above Chestnut. PHILADEL'A.

Send for prices of Scales and Testing Machines of all kinds. Tests of material made daily.



W. C. WREN'S PATENT GRATE BAR.



DAVID S. CRESWELL, Manufacturer,

816 Race Street,

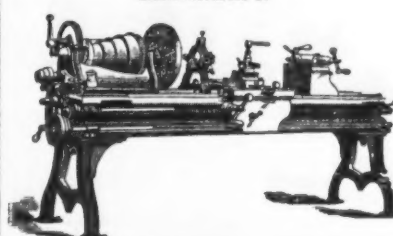
The most durable Grate Bar on the market.

PHILADELPHIA, PA.

Send for circular and price list.

P. BLAISDELL & CO.

Manufacturers of



MACHINISTS' TOOLS

Blaisdell's Patent Upright Drills,

With Quick Return Motion.

Engine Lathes, Planers, Boring Mills,

Gear Cutters and Hand Lathes.

WORCESTER, MASS., U. S. A.

J. W. Gallaudet



Cor. Broadway and Wall St., New York.
Stocks and Bonds dealt in for cash or on margin at
New York Stock Exchange.

MACHINERY FOR
Straightening and Cutting Wire

Of all Sizes to any Length.

Send for Catalogue.

JOHN ADT,

New Haven, Conn., U. S. A.

THE ECLIPSE WAGON JACK

is the SIMPLEST, CHEAPEST and most CONVENIENT in the market. It will raise a 2000-POUND wagon, and is made of the best hard wood, riveted with iron rivets. The BEARING on the bottom is LONG, and the JACK remains FIRMLY in place in use. A SAMPLE will be sent upon receipt of \$1.00. LIBERAL DISCOUNTS to the trade. Sole Agent.

T. C. CONWAY,

88 Chambers St., New York

HOLT

PORTABLE FORGES

Manufactured by

HOLT MFG. CO.

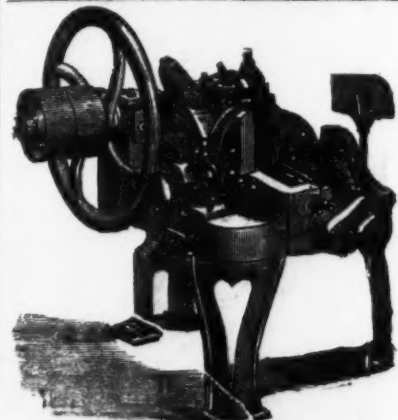
Cleveland, Ohio.

New York Warerooms

79 & 81 Reade St.

F. PORTER THAYER,

Manager.



PITTSBURGH MFG. CO.

Manufacturers of Nail and Spike Machines, Bolts, Nuts, Washers, Rivets, &c. Castings, Forging and Blacksmith Work promptly attended to.

OFFICE & WORKS, Railroad St. near 28th, Pittsburgh, Pa.

THE LA FRANCE FIRE ENGINE CO.

Manufacturers of



Rotary Steam Fire Engines

ELMIRA, N. Y.

JOHN H. WRIGHT,

Manufacturer of

MACHINISTS' TOOLS

FROM THE LATE

WOOD, LIGHT & CO.'S PATTERNS

Of Lathes and Planers.

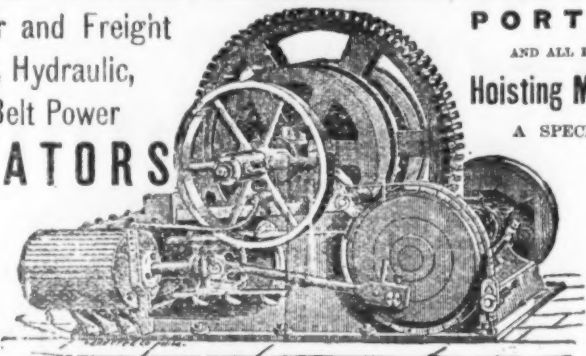
Mr. Wright having formerly been a contractor in building the same, will give superior work to who favor him with their orders.

Gear Cutting a Specialty,

237 Water Street,

BRIDGEPORT, CONN.

Passenger and Freight
Steam, Hydraulic,
and Belt Power
ELEVATORS



PORTABLE
AND ALL KINDS OF
Hoisting Machinery
A SPECIALTY.

IRON FURNACE HOIST.

For Handling Stock to Top of Stack with One or Two Platforms.
STOKES & PARRISH, 3001 Chestnut St., Philadelphia.

\$\$\$ **SAVED** \$\$\$

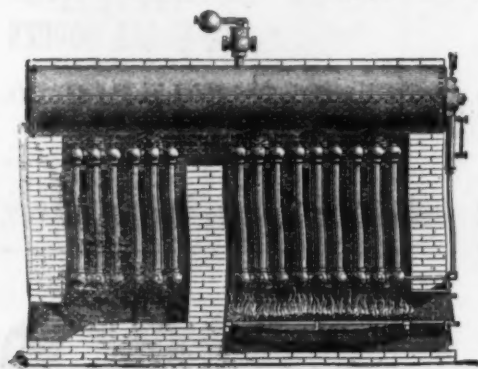
1977 NINETEEN HUNDRED SEVENTY-SEVEN **1977**
MACHINES
BOTH NEW AND SECOND-HAND

COMPRISING
MACHINE AND BLACKSMITH
TOOLS OF EVERY DESCRIPTION.
WOOD-WORKING MACHINERY IN ALL ITS
BRANCHES. PORTABLE ENGINES. UPRIGHT AND HOR-
IZONTAL STATIONARY ENGINES. LOCOMOTIVE FIRE-
BOX, HORIZONTAL, AND UPRIGHT BOIL-
ERS, 1 TO 100 HORSE POWER. WATER WHEELS, COT-
TON AND WOOLLEN MACHINERY, STEAM
PUMPS, GRISTMILL MACHINERY,
Etc., FULLY DESCRIBED, AND
PRICES ANNEXED.

Send stamp for same. In our List No. 23. [stating what you want.]
We have the Largest Assortment of Machinery to be
found in the hands of any firm in the country.
Works and Main Office, **S. C. FORSAITH & CO.**
Manchester, N. H.

Branch Office and Wareroom, 209 Center street, New York City.

DUPLEX SAFETY BOILER.



Unequaled Economy.

Positive circulation, insuring un-
der all circumstances a clean boiler.
No sediment. The best materials.
No joints, but expanded joints in
combustion chamber.
The most durable boiler made.
Send for circular.

DUPLEX SAFETY BOILER CO.,
34 Cortlandt Street,
NEW YORK.

Chicago Office,
45 Franklin Street.



A THE ELKINS MFG. & GAS CO.'S
J AJAX METALS,
X FOR
LOCOMOTIVE, CAR, ROLL NECK AND
MACHINERY BEARINGS,
PUMP RODS, VALVES AND PLUNGERS,
&c.
Furnished in Ingots or Castings.
M Sheet Metals a Specialty.
T THE ELKINS MFG. AND GAS CO.,
617 and 619 Arch St., Philadelphia.
A SOLE MANUFACTURERS
Ajax Metals, Maxim's Improved Gas
Machines,
BARTON'S PATENT STOP VALVE.
S Builders of Gas Works.

WOODLAND FIRE BRICK CO., LIMITED,

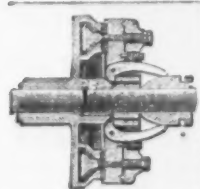
Woodland, Clearfield Co., Pa.,

MANUFACTURERS OF
"WOODLAND" BRAND FOR STEEL FURNACES OF ALL KINDS, BLAST FURNACES AND
MALLEABLE IRON WORKS.

"BRADFORD" Brand for Rolling Mills, Glass Houses, &c.

"W. F. B." Brand for Hot Blast Stoves, Stocks, Cupolas, and all work requiring a close
and very hard brick. Also, Fine Ground Clay to lay brick.

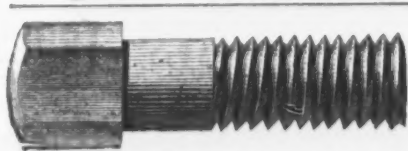
Western Office, 89 Wood Street, Pittsburgh, Pa.



Hoisting Engines & Elevators Safe, Durable and
Reasonable in price.
Friction Clutch Pulleys and Cut-off Couplings.

We manufacture the "Giant Friction Clutch Pulley," known as the "Captain."
Is the BEST IN THE WORLD for connecting the gearing of callender rolls,
hoisting coal, logs or freight. Our Clutch can connect any amount of power, at
any speed, without slackening the motive power in the least, and gives no shock
as it is easy to ship and unship; in fact, this is the only Clutch that can do heavy work
satisfactorily.

D. FRISBIE & CO., 123 N. Fourth St., Phila., Pa.



MACHINISTS' SUPPLIES.

JOHN FELLOWS,

Manufacturer of

SCREWS, NUTS & BOLTS,

Piano Hardware, Agraffes and Novelties in Metal.

Wholesale and Retail Dealer in

IRON, STEEL & BRASS

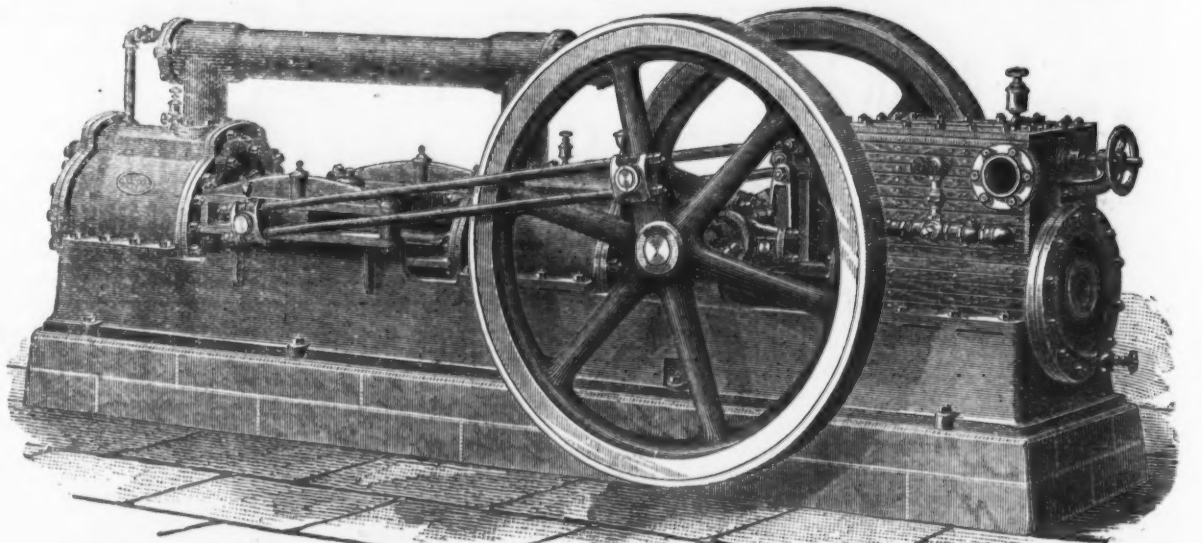
No. 70 Broadway, Brooklyn, E. D.

THORNE, DeHAVEN & CO., Drilling Machines,

21st Street, above Market, Philadelphia.

PORTABLE DRILLS. Driven by power in any direction.
RADIAL DRILLS. Self-feed—Large Adjustable Box Table.
VERTICAL DRILLS. Self-feed.
MULTIPLE DRILLS. 2 to 20 Spindles.
HORIZONTAL BORING AND DRILLING MACHINES.
HAND DRILLS. CAR BOX DRILLS.
SPECIAL DRILLS. For Special Work.

Air Compressors.



THE NORWALK IRON WORKS CO., South Norwalk, Conn.

E. W. Bliss, BLISS & WILLIAMS,
MANUFACTURERS OF ALL KINDS OF
PRESSES and **DIES.**



Also Manufacturers of
SPECIAL MACHINERY

FOR
WORKING SHEET
METALS, &c.
FRUIT & other
CAN TOOLS.

GOLD MEDAL AWARDED



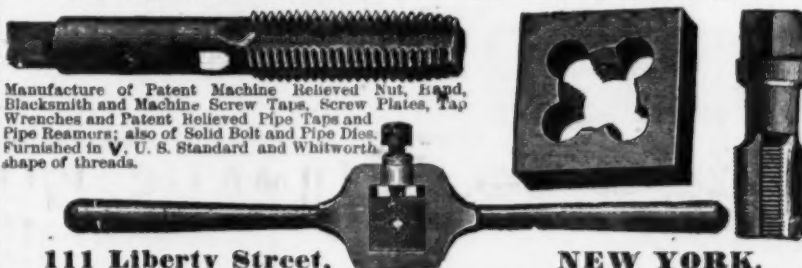
Plymouth, Pearl and
John Streets,
BROOKLYN, N. Y.,
U. S. A.



PARIS EXPOSITION, 1878.

MANNING, MAXWELL & MOORE,

Sole Sales Agents for THE HORSE TWIST DRILL AND MACHINE CO.'S



Manufacture of Patent Machine Relieved Nut, Hand,
Blacksmith and Machine Screw Taps, Screw Plates, Tap
Wrenches and Patent Relieved Pipe Taps and
Pipe Reamers; also of Solid Bolt and Pipe Dies.
Furnished in V. U. S. Standard and Whitworth
shape of threads.

111 Liberty Street,

NEW YORK.

SHAPLEY ENGINE.

Patented Feb. 10, 1874; Reissued June
22, 1875.

Compact, Practical, Durable and
Economical.

Acknowledged to be the best in use. This boiler
stands unrivaled.

MANUFACTURED BY

SHAPLEY & WELLS,

Binghamton Iron Works,

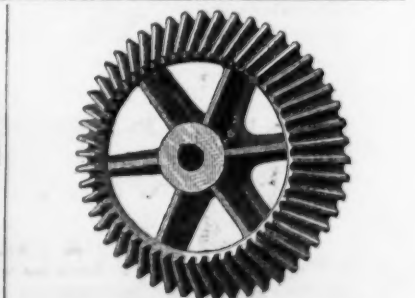
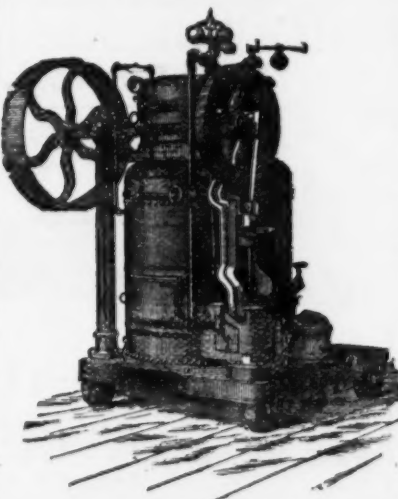
Binghamton, N. Y.

Manufacturers of

Stationary Engines and Boilers.

Also Machinery for Mills of all kinds and
Tanneries. Also their celebrated Bark
Mills, acknowledged to be the best.

Send for reduced price list circular.



Machine Moulded Mill

GEARING,

SHAFTING, PULLEYS, &c.,

In great variety of sizes. Castings or Finished
Work furnished the Trade at favorable rates.

POOLE & HUNT,
BALTIMORE, MD.



DEAD-STROKE POWER HAMMERS.



DIEBELT & EISENHARDT,
MAKERS,
1310 Howard St., Philadelphia.

CRANE BROTHERS MAN'G. CO.,
CHICAGO.

MANUFACTURERS OF
WROUGHT IRON PIPE,
STEAM PUMPS,
STEAM AND GAS FITTINGS,
Steam and Hydraulic

Freight and Passenger Elevators
STEAM HOISTING ENGINES
for Furnaces, Mines, &c.

Stationary Steam Engines &c.

Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.

VALVES.

Double and Single Gate, 1/4 in. to 48 in.—outside and inside Screws, Indicator, &c.,
for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.



WICKERSHAM & CO.,

MANUFACTURERS OF

RAILWAY, MINERS', MILL & MACHINISTS'

SUPPLIES.

W. & Co.'s Packing: Steam, Hydraulic and Locomotive. Sam-
ples sent free.

Lubricants for Engines, Shafting, &c.; Rolling Mill, Railroad.

Gear and Axle Grease.

Also, Star Cylinder Oils.

Samples sent free for trial upon application.

No. 309 Race Street, Philadelphia, Pa.

Price \$12.00.

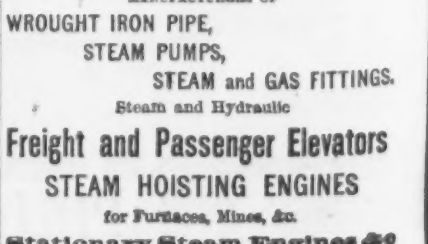
Liberal discount to the trade

Send for Circular.

Manufactured by

CLARK SINTZ,

Springfield, Ohio.



Machinery, &c.

LYON'S HAND OR POWER PUNCHES AND SHEARS.

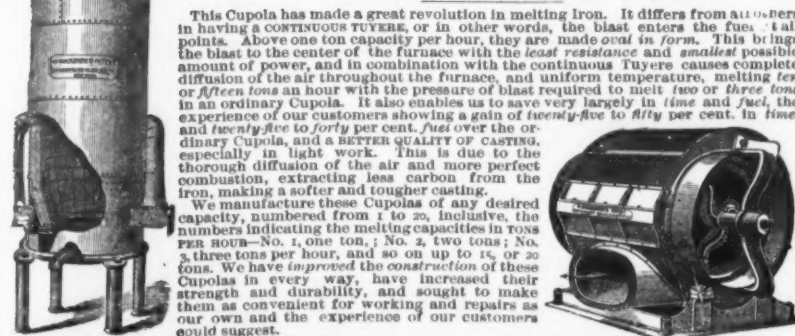
For Round, Flat or Square Iron,
ALSO,
Polishing & Buffing Machinery,
HYDRAULIC JACKS,
To raise from 2 to 120 tons.
HYDRAULIC PRESSES,
For special and general use.
HYDRAULIC HAND & POWER PUMPS
with 1 to 5 plungers, to run hydraulic presses, with
either uniform or changeable speed.
Second-hand Presses.
E. LYON & CO.,
470 B Grand Street, NEW YORK.
Send for circular of what you want.



**THE MACKENZIE PATENT
CUPOLA & BLOWER.**

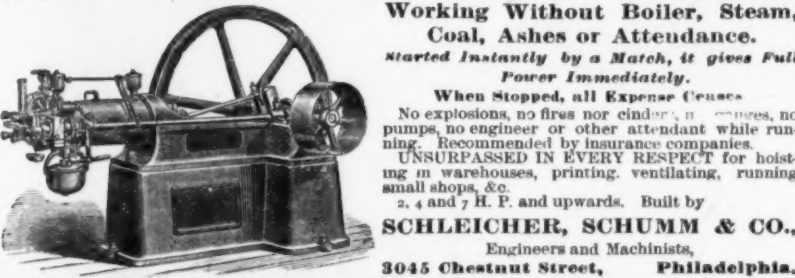
Send for circular to
Smith & Sayre Mfg. Co.,
PROPRIETORS, 245 Broadway, New York.

This Cupola has made a great revolution in melting iron. It differs from all others in having a continuous furnace, or in other words, the blast enters the furnace at all points. Above one ton capacity per hour, they are made oval in form. This brings the blast to the center of the furnace with the least resistance and smallest possible amount of power, and in combination with the continuous Tuyere causes complete diffusion of the air throughout the furnace, and uniform temperature, melting ten or fifteen tons an hour with the pressure of blast required to melt two or three tons in an ordinary Cupola. It also enables us to save very largely in time and fuel, the experience of our customers showing a gain of twenty-five to fifty per cent. in time, and twenty-five to forty per cent. fuel over the ordinary Cupola, and a better quality of casting, especially in light work. This is due to the thorough diffusion of the air and more perfect combustion, extracting less carbon from the iron, making a softer and tougher casting. We manufacture these Cupolas of any desired capacity, numbered from 1 to 25, inclusive, the numbers indicating the melting capacities in tons per hour—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 25, or 30 tons. We have improved the construction of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own and the experience of our customers could suggest.



NEW OTTO SILENT GAS ENGINE.

Working Without Boiler, Steam,
Coal, Ashes or Attendance.
started instantly by a Match, it gives Full
Power Immediately.
When Stopped, all Expense ceases.
No explosions, no fires nor cinders, no
pumps, no engineer or other attendant while run-
ning. Recommended by insurance companies.
UNRIVALLED IN EVERY RESPECT for hoisting
in warehouses, printing, ventilating, running
small shops, &c.
2, 4 and 7 H. P. and upwards. Built by
SCHLEICHER, SCHUMM & CO.,
Engineers and Machinists,
3045 Chestnut Street, Philadelphia.



STEPHEN A. MORSE. C. M. WILLIAMS. EDWIN F. MORSE.
SEND FOR CIRCULARS. **CLEM & MORSE,** LATEST PATENTED IMPROVEMENTS.
Manufacturers and Builders of
ELEVATORS,
Hoisting Machinery, Automatic Hatch Doors, &c.
413 Cherry St., PHILADELPHIA, PA. Branch Office, 108 Liberty St., NEW YORK.

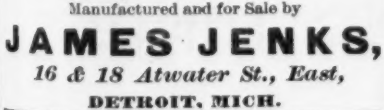


THE DUPLEX INJECTOR.

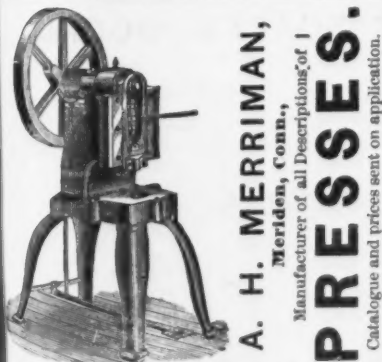
The Best Boiler Feeder
Known.
Unequaled for simplicity and always reliable. Does not require adjustment for varying pressures of steam. Will start when the injector is hot. Less liable to get out of order than a pump. Always delivers water hot to the boiler.
Manufactured and for Sale by
JAMES JENKS,
16 & 18 Atwater St., East,
DETROIT, MICH.



A. H. MERRIMAN,
Meriden, Conn.,
Manufacturer of all Descriptions of
PRESSES.
Catalogue and prices sent on application.




E. E. CARVIN & CO.,
Manufacturers of
Milling Machines, Drill Presses,
Hand Lathes, Tapping Machines, Other
Grinders and Wood Planers, Milling Cut-
ters, all shapes and sizes. Gear Cutting
and Milling in all its branches.



139-143 CENTRE STREET,
Cornell's Building, NEW YORK.
Send for Illustrated Catalogue.



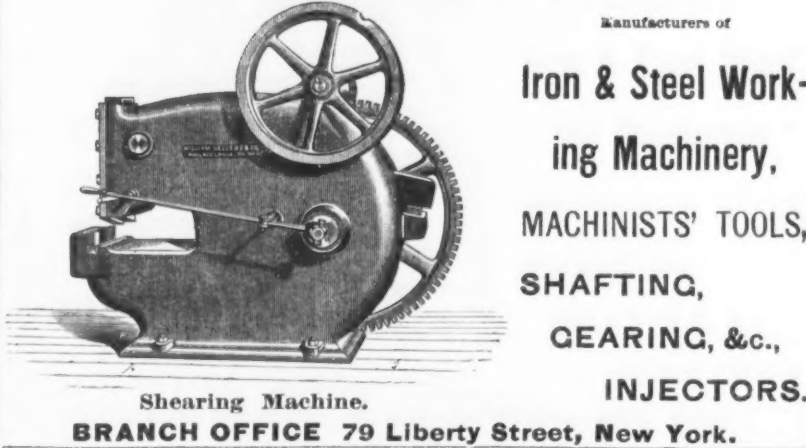
PUTT APPERS
RAPID BOLT CUTTERS
LATEST IMPROVEMENTS
33 CENTERS
CLEVELAND



Machinery, &c.

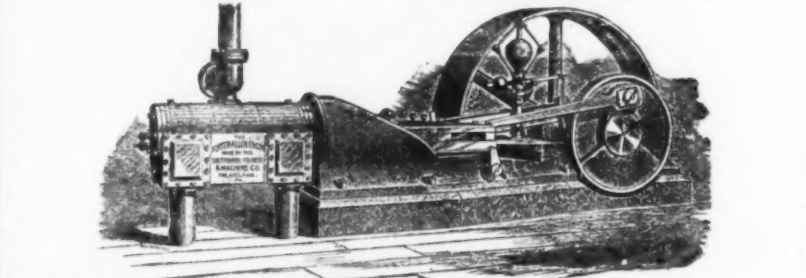
WILLIAM SELLERS & CO.,
PHILADELPHIA.

Manufacturers of
Iron & Steel Work-
ing Machinery,
MACHINISTS' TOOLS,
SHAFTING,
GEARING, &c.,
INJECTORS.
Shearing Machine.
BRANCH OFFICE 79 Liberty Street, New York.



PORTER-ALLEN HIGH-SPEED STEAM ENGINE

W. H. MERRICK, Pres. and Treas. C. T. PORTER, Vice-President.
G. A. BOSTWICK, Secretary. C. B. RICHARDS, Superintendent.

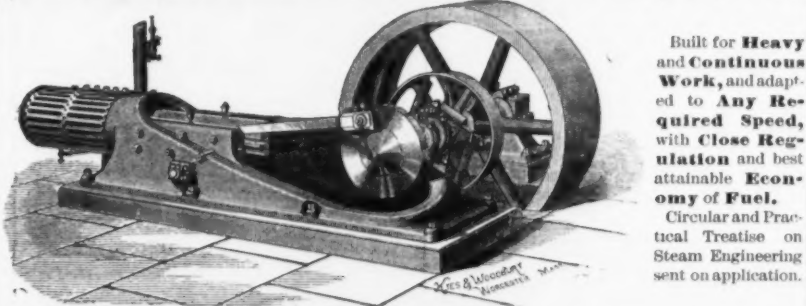


Belts and gearing dispensed with for any speed up to 600 revolutions per minute. Especially adapted to Rolling Mill work, Factories and Electric Light Machines.
Having extensive foundry facilities, the company are prepared to contract for
IRON AND BRASS CASTINGS.
With largely increased facilities we are prepared to fill all orders for the Porter-Allen High-Speed Engine on contract time. Prices and terms inside and out.
Business communications, to receive prompt attention, must be addressed to the company.

THE SOUTHWARK FOUNDRY AND MACHINE CO.,
430 Washington Avenue, Philadelphia.

**THE HARTFORD
AUTOMATIC CUT-OFF ENGINE.**

Built for Heavy and Continuous Work, and adapted to Any Required Speed, with Close Regulation and best attainable Economy of Fuel. Circular and Practical Treatise on Steam Engineering sent on application.



The HARTFORD ENGINEERING COMPANY,
HARTFORD, CONN.
NEW YORK OFFICE, - - ROOMS 72 and 73, ASTOR HOUSE.

Solid Drawn Steel Tubes
WITHOUT A WELD.

Suitable for Hydraulic Work, Boring Rods, Sockets, Axles, Collars, Bushings, Ferrules, Sleeves, &c., &c. Smoothly finished inside and out. From 1/4 in. to 4 1/2 in. outside diameter, and Walls 1-16 to 1-16 in. thick.
IMPORTED ONLY TO SPECIAL ORDER.
PHILIP S. JUSTICE & CO.,
14 N. 5th St., Philadelphia.

HARRISON BOILER. "THE SAFEST"

Adapted for All Steam Purposes.
Merits have been proved during ten to fifteen years, constant use by such concerns as Cheney Bros., S. Manchester, Conn.; Wallace & Sons, Ansonia, Conn.; Wampanoag Mills, Westamoo Mills, Sagamore Mills, Fall River, Mass.; Sears Building, Boston, Mass.; Brown & Sharpe Mfg. Co., Providence, R. I.; A. T. Stewart & Co., Tiffany & Co., New York; Stevens Institute, Hoboken, N. J.; Matthiessen & Wier's Sugar Refinery, Jersey City, N. J.; Wm. Sellers & Co., S. S. White, Daniel Allen, Jno. Garliser & Co., Phosphor-Bronze Smelting Co., Henry Bower, Evening Bulletin, Saturday Night, Philadelphia, Pa., and numerous others.
Franklin Institute medal awarded for superiority of evaporative efficiency, economical capacity for generating steam and dynamic value of steam. Easily transported on mule back.
Send for descriptive catalogue.



HARRISON BOILER WORKS • 15th AND WOOD STS • PHILADELPHIA PA

CHARLES W. ERVIE & CO.,
Engine Builders, Boiler
Makers and
GENERAL MACHINISTS,
IRELAND STREET, PHILADELPHIA.

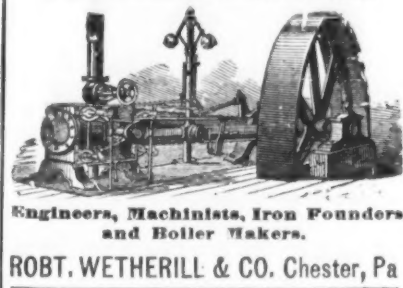


STEEL STAMPS STENCIL BRANDS PAINT
RUBBER STAMPS STAMPING INK &c.
A. M. MICHAEL, ALBANY, N.Y.



Machinery, &c.

Corliss Engine Builders,
With Wetherill's Improvements.




Engineers, Machinists, Iron Founders
and Roller Makers.
ROBT. WETHERILL & CO. Chester, Pa

STOW FLEXIBLE SHAFT CO., Limited,
15th & Pennsylvania Ave.
PHILADELPHIA, PA.,
Manufacturers of
Portable Drilling,
Tapping, Reaming
and Boring
Machines.
Also, Tools
for Emer-
gency Work-
ing, Metal &
Wood Polish-
ing, Cattle
Brushing, &c.




PHILA. SHAFTING WORKS.
GEO. V. CRESSON,
18th & Hamilton Sts
PHILADELPHIA.
**SHAFTING
A SPECIALTY**
Manufacturers
Shafting, Pulleys,
Hangers, Couplings
and every appur-
tenance used in the
TRANSMISSION OF
STEAM POWER.




COX & SONS' NEW VERTICAL ENGINES.
Four to Sixteen Horse Power.



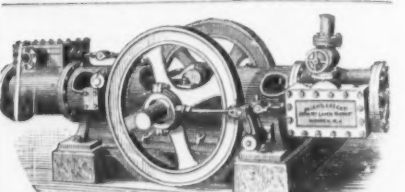
Established 1867.
Edwin Harrington & Son
MANUFACTURERS OF
PATENT EXTENSION AND
SCREW CUTTING
LATHES,
Iron Planers,
Radial, Upright, Suspension
Multiple and Lever
DRILLS,
and a variety of other
MACHINISTS' TOOLS
Patent
Double Chain Screw
Pulley Blocks,
unrivalled for Durability
Safety and Power.
Patent Double Chain
Quick-Lift Hoists,
with Brake for quick and easy
lowering.
Circulars furnished.
WORKS AND OFFICE
Cor. N. 14th and Penna. Ave
Philadelphia, Pa., U.S.A.
Represented by J. Q. MAY
NARD, 57 Liberty Street, N. Y.
C. E. KIMBALL, 128 Oliver St.,
Boston.



Edwin Harrington & Son
MANUFACTURERS OF
PATENT EXTENSION AND
SCREW CUTTING
LATHES,
Iron Planers,
Radial, Upright, Suspension
Multiple and Lever
DRILLS,
and a variety of other
MACHINISTS' TOOLS
Patent
Double Chain Screw
Pulley Blocks,
unrivalled for Durability
Safety and Power.
Patent Double Chain
Quick-Lift Hoists,
with Brake for quick and easy
lowering.
Circulars furnished.
WORKS AND OFFICE
Cor. N. 14th and Penna. Ave
Philadelphia, Pa., U.S.A.
Represented by J. Q. MAY
NARD, 57 Liberty Street, N. Y.
C. E. KIMBALL, 128 Oliver St.,
Boston.



AIR COMPRESSORS.
**ALLEN'S
HIGH-SPEED AIR COMPRESSORS**
With Positive Moving Valves.
Allen Engines, Stationary and Marine Boilers,
Hoisting Machinery. Also, Patent Evaporators
and Condensers for Animal Matters.
AIR COMPRESSORS A SPECIALTY.
JOHN McLAREN,
River Street, - - HOBOKEN, N. J.



THE HANCOCK INSPIRATOR,
New Combined Pump and Injector.
Eclipses all other appliances hitherto introduced for
feeding Steam Boilers. A Portable Boiler is not per-
fect without one. It lifts its water 20 feet with a low
steam pressure, and puts it directly into the boiler.
No adjustment necessary for varying steam pressures.
W. STORER, General Agent, 149 N. 3d St., Phila



KATZENSTEIN'S
Self-Acting Metal
Packing,
For Piston Rods, Valve
Stems, &c.,
Of every description,
For Steam Engines,
Locomotives, Pumps,
&c. &c.
Adopted and in use by
the principal Iron
Works and Steamship
Companies within the
last eight years in this
and Foreign countries
For full particulars
and references address
L. KATZENSTEIN & CO.,
35 Dearborn St., New York.



TUBAL SMELTING WORKS.

760 South Broad Street, PHILADELPHIA.

PAUL S. REEVES,

MANUFACTURER OF

ANTI-FRICTION METALS.

CAR & MACHINERY BRASSES, INCOB BRASS
AND SOLDER, WHITE BRASS.

Old Metals and Brass Turnings Wanted.

ESTABLISHED 1842.

WM. & HARVEY ROWLAND,
PHILADELPHIA,

P. O. Address: Frankford, Philad'a. } MANUFACTURERS OF ALL KINDS OF

Elliptic, Platform AND C Springs,

"Brewster Side Bar Combination
Patented" Springs.

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.
CAST SHOVEL, HOE AND MACHINERY STEEL.

OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.

BESSEMER SHOVEL AND PLOW STEEL.

BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.

NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

STEEL
CASTINGSFROM 1-4 TO 10,000 LBS. WEIGHT.
True to pattern, sound and solid, superior in strength, toughness and
durability to iron forgings in any position, or for any service what-
ever. Gearing of all kinds, Shafts, Dies, Hammerheads, Crossheads
for Locomotives, etc. 14,000 Crank Shafts and 10,000 Gear wheels of
this steel now running prove its superiority over other Steel Cast-
ings. CRANK SHAFTS, CROSSHEADS AND GEARING ARE SPE-
CIALTIES. Circulars and Price Lists free.
AddressCHESTER STEEL CASTINGS CO.,
Works, Chester, Pa. 407 Library St., Philadelphia.

IMPROVED STEEL CASTINGS.

Under Hainsworth's Patents.

We make Castings practically free from blow-holes, of steel which is as soft and as
easily WORKED and WELDED as Wrought Iron, yet is STIFF, STRONG and DURABLE, with a
TENSILE STRENGTH of not less than 65,000 lbs. to the square inch. In short, our CAST-
INGS UNITE THE QUALITIES OF STEEL AND WROUGHT IRON.Wheels and Pinions, Dies and Hammer Heads, Engine and Machinery Castings of all
descriptions, Railroad Frogs and Crossings, Plowshares, Moldboards and Landsides.
WE USE NO CAST IRON.

Send for circular.

PITTSBURGH STEEL CASTING CO.,
PITTSBURGH, PA.

Punching Presse

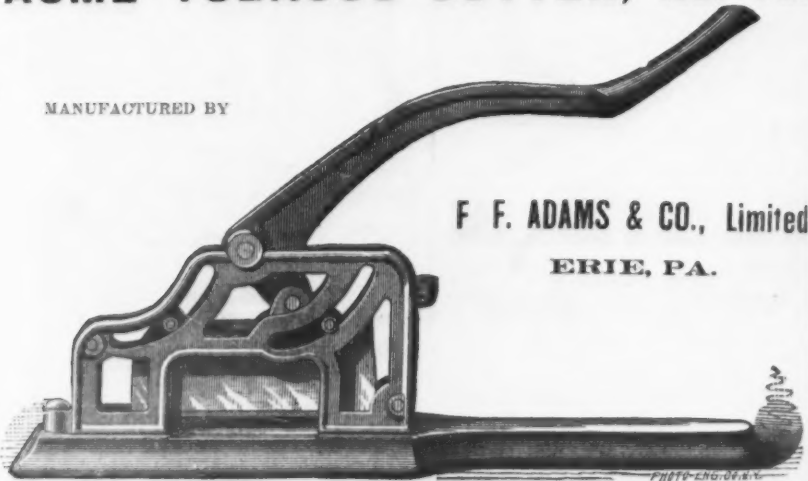
DIES AND OTHER TOOLS

For the manufacture of all kinds of

SHEET METAL GOODS,
DROP FORGINGS, &c.Stiles & Parker Press Co.,
Middletown, Conn.

ACME TOBACCO CUTTER, No. 10.

MANUFACTURED BY



F. F. ADAMS & CO., Limited

ERIE, PA.

INDIANA FOUNDRY COMPANY, Indianapolis, Indiana.

MANUFACTURERS OF ALL KINDS OF CASTINGS.

CASTINGS
JAPANESE,
BRONZED,
COPPERED
ANNEALED.Before ordering elsewhere, write
us for prices and samples of our
work.FINE
SOFT
GRAY
IRON
CASTINGS.Merrill Brothers,
26 First Street,
BROOKLYN, N. Y.

DROP

HAMMERS,
FORGINGS and
POWER PRESSES.

WOOD, JENNISON & CO.,

Manufacturers of SHAFTING, PULLEYS AND HANGERS—A Specialty.
Also Wood's Patent Bolt Threading Machine. Worcester, Mass.

STANLEY G. FLAGG & CO.

PHILADELPHIA, PA.

Office and Works,

N. W. cor. 19th St. & Pennsylvania Ave.

Manufacturers of

STEEL CASTINGS.

A Substitute for Steel & Wrought Forgings
Circulars sent on application.

Steel Castings.

Light and heavy Steel Castings of superior
metal, solid and homogeneous. All work guaran-
teed. Send for circular.

EUREKA CAST STEEL CO.,

Chester, Pa.

Office: 307 Walnut St., Phila.

FOR NIGHT DRIVING!

No. 0 TUBULAR

REFLECTOR LANTERN

In a COULTER HOLDER Underneath Any
Vehicle will Brilliantly Light the Roadway.With the New Spring Attachment it can be
used on the dash.

Throws a powerful light more than 100 feet.

Remodeled and Improved
TUBULAR HOT BLAST
OIL AND GAS STOVES FOR 1882.

SEND FOR SAMPLE STOVE.

R. E. DIETZ,

54 & 56 Fulton St.,

NEW YORK.

COLUMBIA BICYCLE.

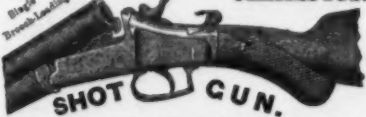
The Bicycle, as a permanent,
practical road vehicle, is an
acknowledged fact, and the
thousands in daily use are
constantly increasing in num-
bers. It combines speed and
endurance that no horse can
equal, and for pleasure or
health is far superior to any
other outdoor sport. The art
of riding is easily acquired,
and the exercise is recom-
mended by the medical pro-
fession as a means of renew-
ing health and strength, as it
brings into action almost
every muscle of the body.
Send 3c stamp for a page of
illustrated catalogue, contain-
ing price lists and full infor-
mation.

THE POPE MFG. CO.,

597 Washington St., Boston, Mass.

New York Riding School, 34th
Street, near 4th Avenue.

New Model, Top Snap, CHAMPION

It has a Patent Top Snap Action, by means of
which the gun can be opened by pressing the lever either to
the right or left, an improvement found in no other gun. It
has the Rebounding Lock, which ensures safety in
loading beyond a doubt. The other improvements are the
Pistol Grip Stock, and the Patent Fore-End
Fastening. By means of the Patent Fore-End Fastening
the barrel can be detached from the stock in an instant, and
quickly replaced. The shells used in this gun are the cen-
tral fire, paper or brass. The brass shells can be reloaded
many times. Prices: Plain Barrels, 12 bore, \$15.00; Plain
Barrels, 10 bore, \$18.00; Twist Barrels, 12 bore, \$18.00; Twist
Barrels, 10 bore, \$20.00. Address
JOHN J. LOVELL & SONS, Gun Dealers, Boston, Mass.
Send stamp for Illustrated Catalogue.BUFFALO BLACKSMITHS' BLOWERS
& PORTABLE FORGES
FOR SALE BY ALL DEALERS
BUFFALO FORGE CO. MFRS
BUFFALO, N. Y.
SEND FOR CIRCULAR & PRICE LISTLight Soft Gray Iron
CASTINGS

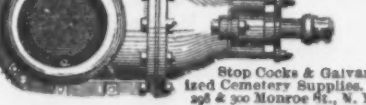
METAL PATTERN MAKING.

THE CRAIGHEAD & ELWELL

MANUFACTURING CO.,

33 Barclay Street and 38 Park Place,

FACTORY, BRIDGEPORT, CONN.

John McLean,
Manufacturer of
Ayers' Hydrants.Stop Cocks & Galvan-
ized Cemetery Supplies,
22 & 30 Monroe St., N. Y.

TACKLE BLOCKS.

Rope and Iron Strap of all kinds. Lig-
numvite Wood for Ten-Pin Balls.

Wm. H. McMillan & Bro.,

Office, 113 South Street, New York.

Factory, 39 to 40 Penn St., Brooklyn, E. D.

AIR COMPRESSORS.

PRICES REDUCED. SEND FOR NEW CATALOGUE.

CLAYTON STEAM PUMP WORKS.

14 AND 16 WATER STREET, BROOKLYN, N. Y.

Scranton Brass Works,

J. M. EVERHART,

Manufacturer of

BRASS WORK,

For Water, Gas & Steam. Also

Carr & Wilcox's Patent Cut Files.

Will cut faster, wear longer, and clog
less than any file in the market.

ONE STREET, SCRANTON, PA.

RUSSELL, BURDSALL & WARD,

PORTCHESTER, N. Y.,

MANUFACTURERS OF

CARRIAGE, TIRE, PLOW, STOVE & OTHER BOLTS.

Carriage Bolts made from Best Square Iron a Specialty.

JOHN RUSSELL CUTLERY CO.,

Green River Works,

MANUFACTURERS OF

Table and Pocket Cutlery,

BUTCHERS', HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES

IN ALL STYLES AND VARIETIES.

OLDEST AND LARGEST AMERICAN MANUFACTURERS.

New York Office.

25 Chambers Street.



Factories.

Turners Falls, Mass.

F. W. WURSTER,

IRON FOUNDRY

AND AXLE WORKS,

130 to 149 First St.,

Brooklyn, N. Y.

AXLES

SUPERIOR

WAGON, CART AND

TRUCK AXLES.

Our facilities enable us to quote the
trade lower prices than any other
manufactory. Send for price list.

J. M. CARPENTER

PAWTUCKET, R. I.

MANUFACTURER OF TAPS AND DIES.

THE POOR MAN'S BUCK SAW.

THE FASTEST CUTTING BUCK SAW IN THE WORLD.

It cuts twice as much wood with one blow as any other saw.

UNLIT WORKMEN CAN USE IT AS EASILY AS A RESHAW CAN SHARPEN THE COMMON SAW.

THE POPE MFG. CO.,

597 Washington St., Boston, Mass.

New York Riding School, 34th
Street, near 4th Avenue.

THE POPE MFG. CO.,

597 Washington St., Boston, Mass.

New York Riding School, 34th
Street, near 4th Avenue.

THE POPE MFG. CO.,

597 Washington St., Boston, Mass.

New York Riding School, 34th
Street, near 4th Avenue.

THE POPE MFG. CO.,

597 Washington St., Boston, Mass.

New York Riding School, 34th
Street, near 4th Avenue.

CLIMAX

ADJUSTABLE

SPRING HINGES.

FOR

SCREEN DOORS,

8 Inch.

Single Acting, Surface.

Single Acting, Mortise.

Double Acting, Mortise.

Walnut Bronzed.

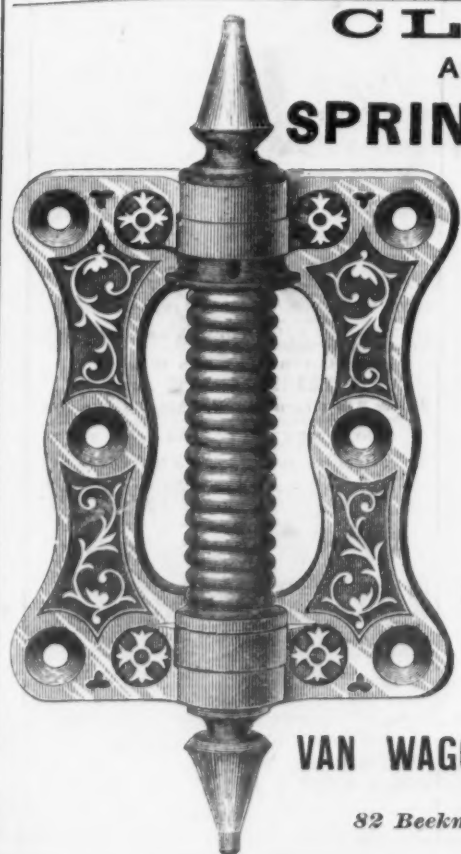
PACKED WITH SCREWS.

Send for Catalogue.

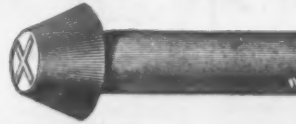
Manufactured by

VAN WAGONER & WILLIAMS,

82 Beekman Street, New York.



BALTIMORE RIVET AND SPIKE WORKS.

Rivets,
Spikes,
Bolts,
Nuts,Washers
Bolt Ends,
Wood Screws,
Track Bolts.

WM. GILMOR of WM., cor. President & Fawn Sts.